ELECTRICAL WEST

December 1954
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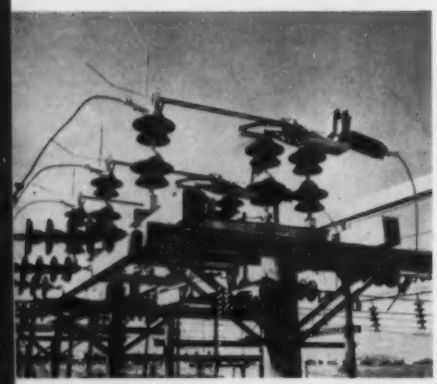
Jubilee's Biggest Promotion 93

Treasure Hunt for Net 81



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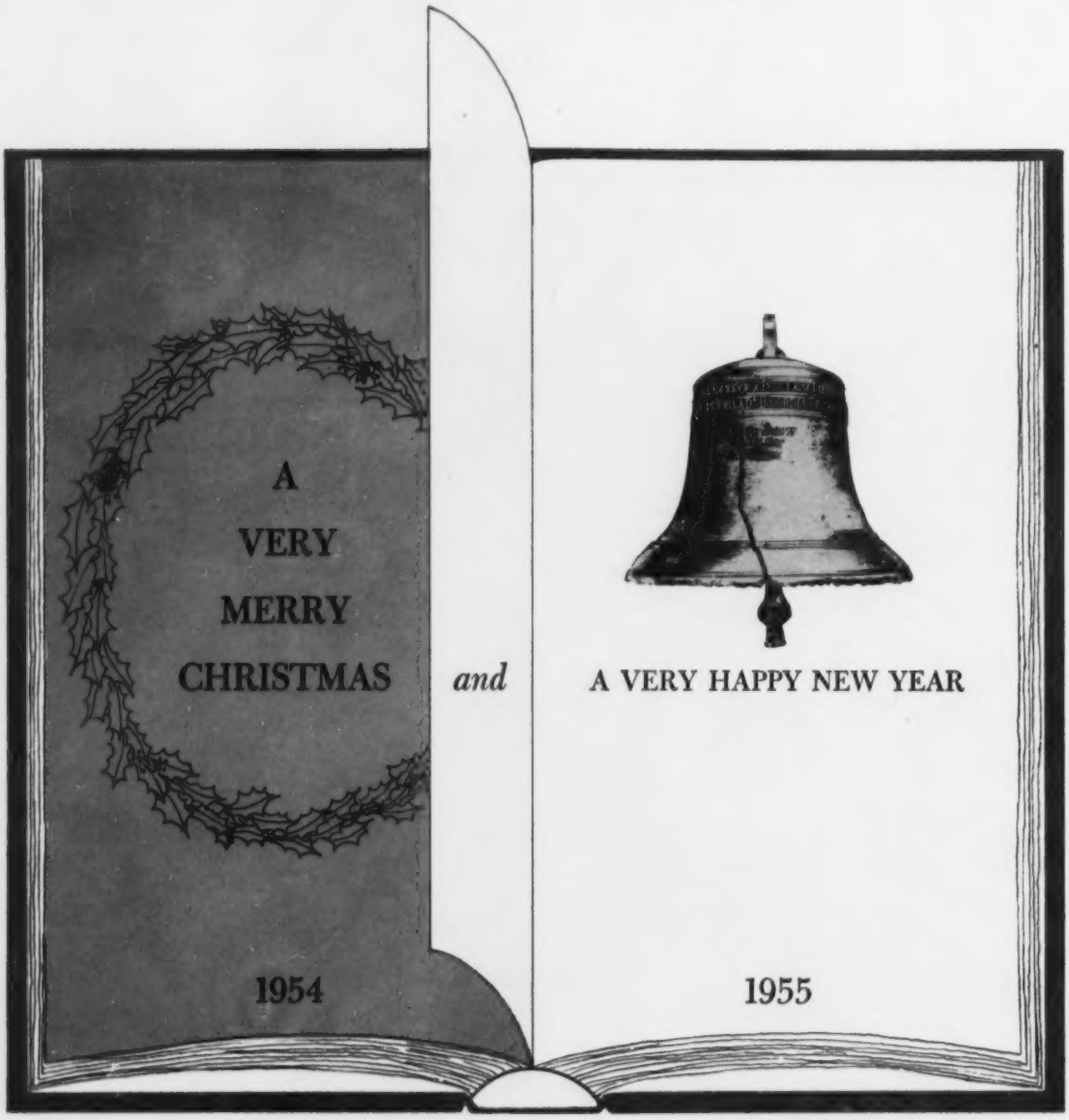
Our best wishes to you for



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year of service to Central and Southern California

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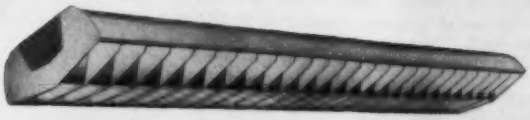

168 TROFFER

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THESE ARE FACTS!

For parking lots, service stations and used car lots let us be the interpreter through this maze of engineering data. PS-52 1000 watt lamps used in a porcelain enameled reflector such as the "MASTER flood yield 17 beam lumens per watt. Far more than most other types of lighting. For the same energy cost you receive 70% MORE LIGHT with a SMOOT-HOLMAN "MASTER" floodlight than with other types. Less lamp changes required by using this "MASTER" flood rather than smaller wattages. For less than ½ the lamp cost you receive the same amount of light. THESE ARE COLD FACTS... ARE YOU GETTING LUMENS OR LEMONS? You can apply similar advantages to offices, schools and factories with SMOOT-HOLMAN QUALITY LIGHTING EQUIPMENT... THERE IS A DIFFERENCE.

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DECEMBER 1954

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright. Sixty-seventh year of publication

VOL. 113 NO. 6

ELECTRICAL WEST

George C. Tenney, Editor
W. A. Cyr, Associate Editor — Walter C. Heston, Engineering Editor
Peggy Boyer, Associate Editor — John Coetz, Typography

Next Month

Because of the renewed interest in electric house heating, an article is planned for January on the experience of a utility with a high percentage of saturation of space heating.

In engineering there will be an important article on new developments in aluminum connectors and fittings to solve the corrosion and galvanic-action problem.

Two new steam-electric plants, Encino and Saguara, will be the subject of descriptive articles.

Stringing of conductors for transmission and distribution under tension to prevent damage to aluminum conductors or to keep wires out of hot lines below is receiving a great deal of attention in the West. There will be an article describing use of a new tension machine for stringing three 12-kv conductors in one operation.

For electrical contractors and consultants there will be two articles of particular interest. One will describe the facilities, modern in every respect, of the new Underwriters' Laboratory near San Francisco. The other will cover the first luminous ceiling lighting installation in a new school in the West.

Regular features, including the valuable contractors' news letter and sales letter and news of the industry will round out the January issue.

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Cover: Holiday lighting in Salt Lake City. Photo by Clyde Anderson.

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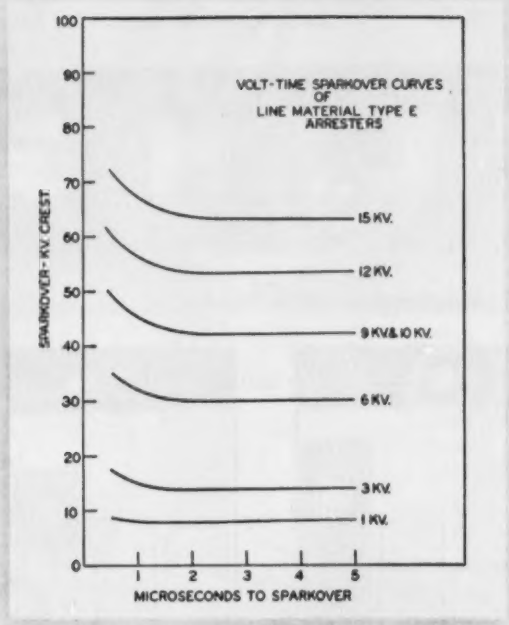
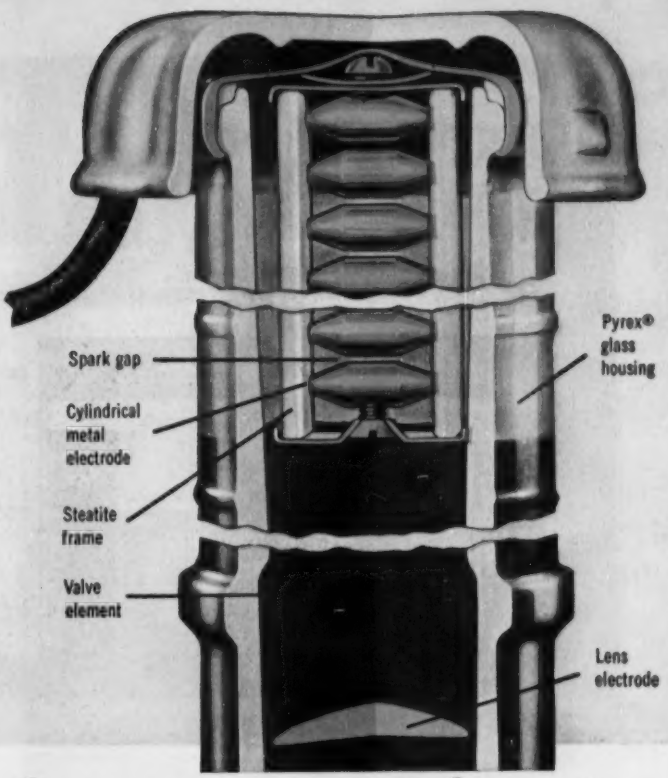


Volt-time curves of arrester sparkover on impulse. These curves illustrate the quick response of the arrester to lightning surges. At all points of the curve the impulse sparkover of the arrester is far below the insulation strength of the distribution equipment being protected.



How L-M's Type E Valve Arrester Balances 60-Cycle Sparkover and Impulse Sparkover

By **GEORGE W. COOPER**
Manager
Protective Equipment Sales
Line Material Company

L-M's Valve Arrester spark gap is designed to prevent unnecessary 60-cycle sparkover of the arrester to harmless switching surges, whereas the low and consistent impulse sparkover brings the arrester into operation quickly and dependably in case of a dangerous lightning surge.

Precision Spark Gap

The spark gap is made of electrode members, accurately spaced and supported by a strong machined frame of high-grade steatite. The gap is so designed that its 60-cycle sparkover value is approximately 1.8 times the rating of the arrester under wet conditions. This is sufficient to keep normal switching surges from sparking over, and provides a path to drain off higher switching and lightning surges.

At higher surge voltages the combination of the metal electrode and the steatite produces an instantaneously ionized, electrically fast path. This combination, together with the cylindrical design of the electrodes, forms a ladder gap unit with a low impulse sparkover.

High Discharge Capacity

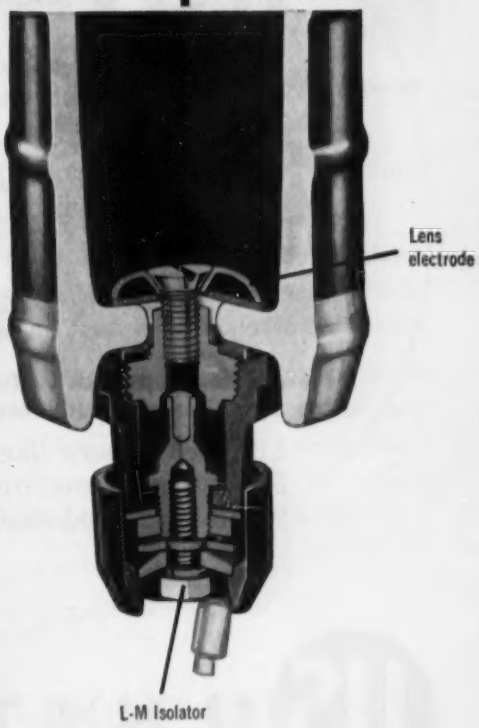
L-M's exclusive bonded valve element combines low IR drop with more than enough capacity to handle the 65,000-ampere surges prescribed by NEMA. It acts as a valve to limit power follow current to a negligible value.

The result of all these features is that the L-M Type E arrester is outstanding in the protection it provides, in its long life under severe lightning conditions, and in its permanent, never-changing characteristics. L-M valve-type arresters amply meet all NEMA standards.

In addition, L-M's "ISOLATOR" provides positive assurance against grounding feeders, by disconnecting the ground lead from the arrester, if the arrester should ever become damaged.

Get This Bulletin

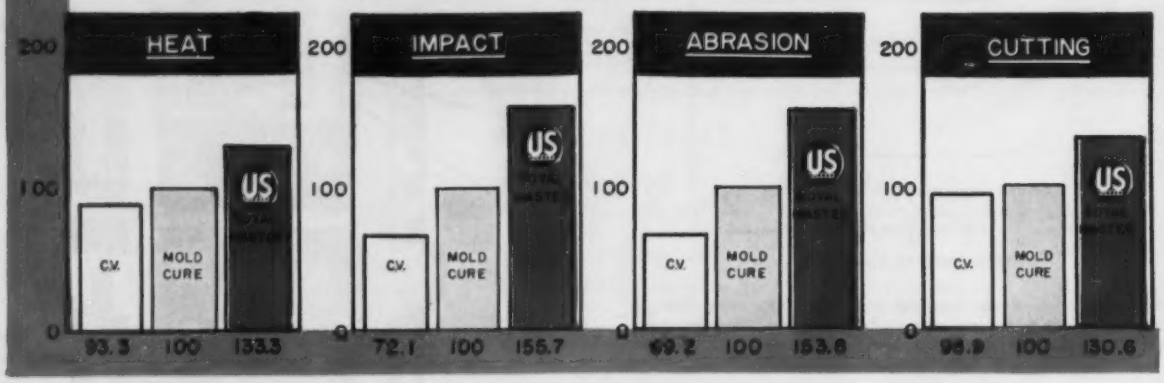
Get the whole story of L-M arrester performance and application. Ask the L-M Field Engineer for a copy of Bulletin LA2; or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).



LINE MATERIAL *Lightning Arresters*

STARTLING

Comparative performance of portable cords related to major life factors.



New U. S. ROYAL MASTER portable cord

PROVES SUPERIOR TO ALL OTHERS IN EVERY SERVICE FACTOR!

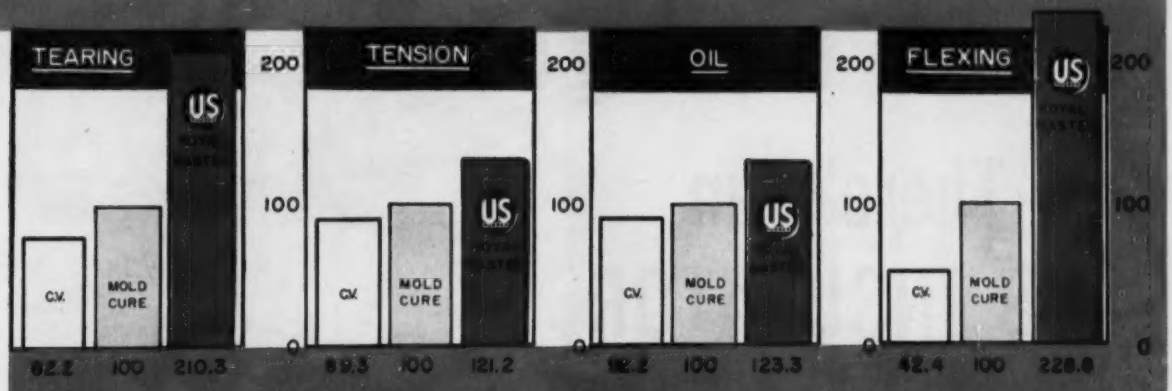
Newly developed U. S. Royal Master Cord gives almost twice the service of other molded cords — gives $1.88 value for every cord $1.00!

Life factor charts illustrate outstanding superiority of new U. S. Royal Master over the average of both the molded cords and the short-lived continuous vulcanized cords of other makes.

US RUBBER

UNITED STATES
ELECTRICAL WIRE & CABLE DEPARTMENT

EVIDENCE!



LOOK FOR THE NAME—U. S. ROYAL MASTER

Approved by Underwriters' Laboratories, Inc.

Cord construction completely reexamined. Over two years ago, U. S. Rubber engineers began a thorough reexamination of electrical cord design and construction. More than a thousand cords, including those of all major competitors as well as our own U. S. Royal Cord, were thoroughly and painstakingly analyzed. Over 10,000 tests were made to determine the principal causes of cord failure.

Every possible life factor was carefully and honestly appraised to find its relation to overall cord service.

With the findings at hand, "U. S." Engineers then drew upon their 64 years of experience in the manufacture of fine quality wire and cable to produce this exceptional new cord.

Every fault uncovered by the exhaustive two-year testing was tackled and solved.

Tested and proved. The new U. S. Royal Master was then tested against all competitive cords—installed in outside plants for final on-the-job corroboration.

U. S. Royal Master Cord proved itself to be unquestionably the finest cord you can buy! So superior, it gives almost double the service life of the average of competitive molded cords—actually gives you $1.88 in value for every cord dollar!

Prove for yourself the outstanding superiority of new U. S. Royal Master Portable Cord—in both service life *and* economy! Get in touch with your "U. S." distributor today!

RUBBER COMPANY
ROCKEFELLER CENTER, NEW YORK 20, N. Y.

There's an O-B INSULATOR to meet your needs

...quickly available via Graybar!

After you have determined which insulator provides the mechanical and electrical characteristics needed for your particular pole-line requirements, depend on Ohio Brass to produce the very best of the proper type . . . pin type, post, strain, suspension, or spool insulators – all available via Graybar.

Insulators are, of course, a part of the wide range of pole line distribution system materials manufactured by Ohio Brass . . . distributed via Graybar. Constant readiness to serve you is an outstanding Graybar service. With over 110 offices and warehouses strategically located throughout the country, you can depend on us. Graybar has – and will have – quality pole line distribution and transmission materials you need . . . where and when you need them.

And should a difficult problem concerning pole line construction arise – call on a Graybar Outside Construction Specialist to work with your engineers. He'll be glad to help you find the best way to a fast, economical solution. Complete information is yours for the asking – just call the Graybar Representative nearest you. 461-812

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IN OVER 110 PRINCIPAL CITIES

Add invisible cops to your police force!

Light and lots of it is the very best deterrent there is to crimes of violence. That is why it is so terribly important that residential streets, as well as boulevards and shopping areas, be adequately and dependably lighted.

Dependable lighting has to be more than good looking, scientifically designed lighting fixtures. The power cables are part of it too. Such cables must be able to withstand winter thaws and freeze-up, as well as summer rains. They must also withstand high summer heat and winter cold.

ANHYDREX Series Street Lighting Cables do this and more. They can be buried in the ground or pulled through ducts. Sometimes they are used inside the lighting standard. But regardless of how they are used, they are dependable. They require no lead sheaths or metallic armor.

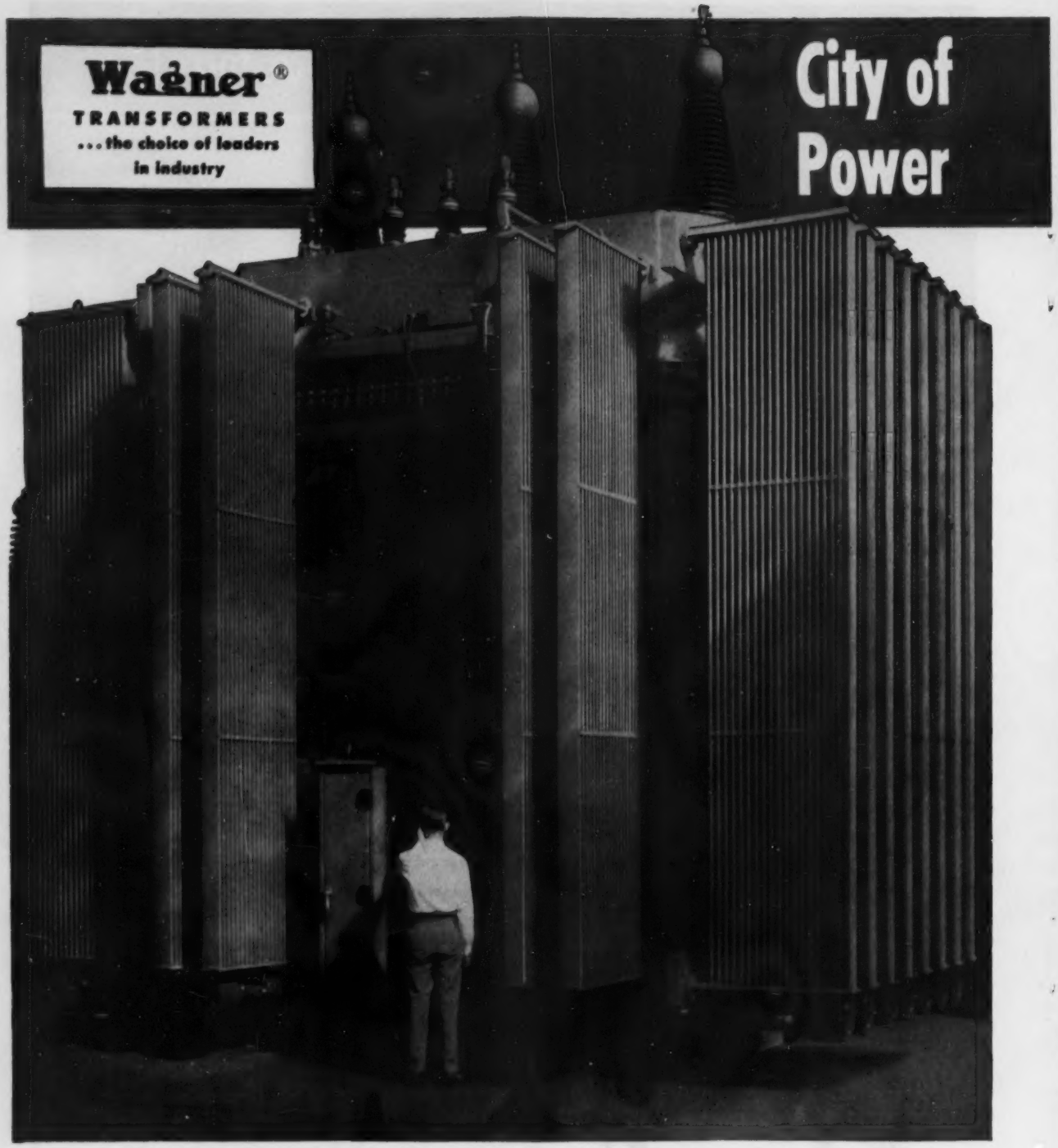
Want to know more about these versatile street lighting cables that can be used overhead or underground with or without ducts? Write us directly or contact our representative in your area for more detailed information.

Simplex–ANHYDREX Series Street Lighting Cables

SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Mass.

Wagner®
TRANSFORMERS
...the choice of leaders
in industry

City of
Power



This Wagner Power Transformer is one of two installed in Tacoma, Washington. Each is rated 30,000/37,500/50,000 kva, class OA/FA/FA three-phase, 60 cycle, 105000Y to 13,800 volts.

Wagner
Electric Corporation
EST. 1891

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

T54-4

Tacoma installs two new Wagner Transformers to supply growing loads

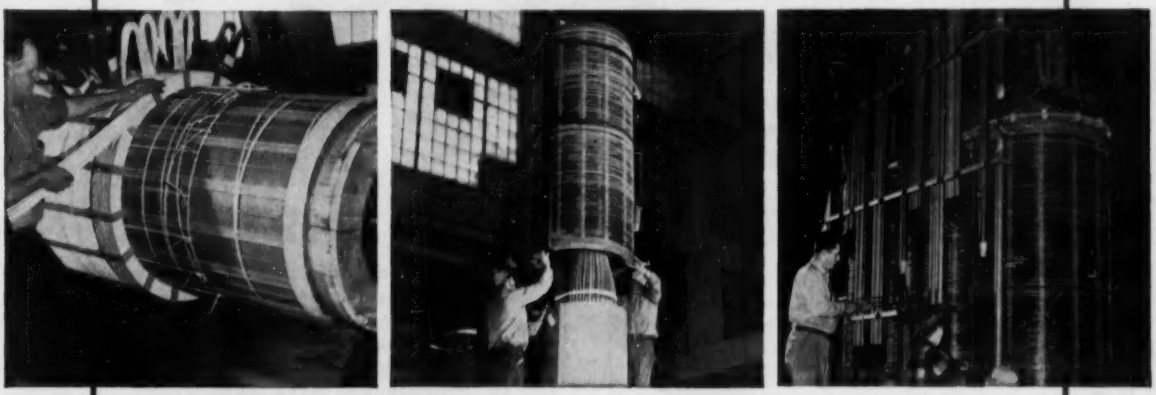
The Tacoma, Washington, Department of Public Utilities has recently installed two new Wagner Power Transformers each rated 30,000/37,500/50,000 kva, class OA/FA/FA, as part of an expansion program to help supply its constantly growing power load.

Wagner Transformers were chosen by the City of Tacoma, as they are by many power companies, because of their reputation for adequate and reliable service.

Wagner has been building power transformers for more than sixty years. The knowledge gained and the facilities acquired in all those years make the building of fine power transformers part of the day's work at Wagner.

Years of engineering "know-how"—Wagner's insistence on the use of only the highest quality materials—carefully controlled production methods—rigid inspections and tests all combine to assure users power transformers that will provide utmost reliability and service continuity.

Wagner's newly increased facilities now permit the manufacture of power transformers in ratings to meet your needs. It will pay you to consult Wagner on your next power transformer installation.



Every step in the construction of Wagner Power Transformers receives special attention. Three operations are shown above. Highly skilled workers wind a low voltage coil, carefully place a high voltage stack into position, and make the final connections on a core and coil assembly.

Thirty-two branch offices, located in principal cities, are at your service. Bulletins TU-180 and TU-181 give information on the complete line of dependable Wagner Transformers.

WAGNER ELECTRIC CORPORATION

6381 Plymouth Ave. • St. Louis 14, Mo., U. S. A.

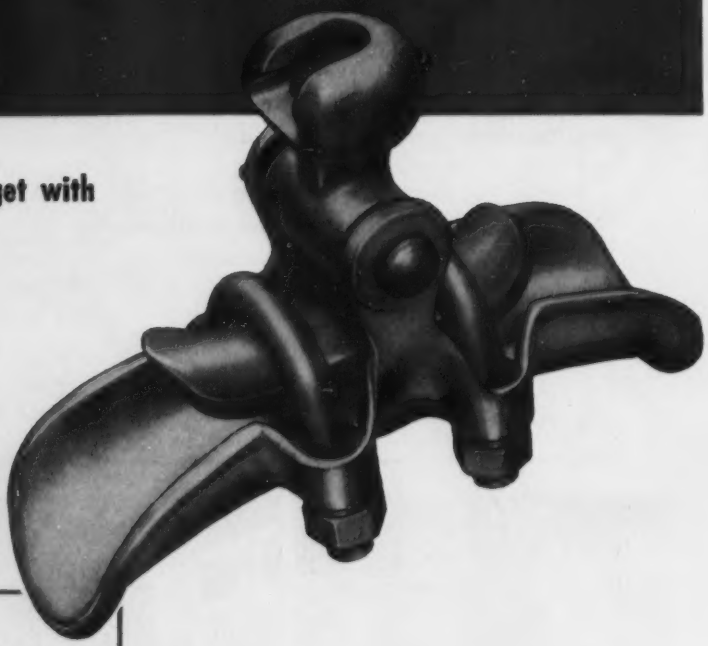
BRANCHES IN 32 PRINCIPAL CITIES

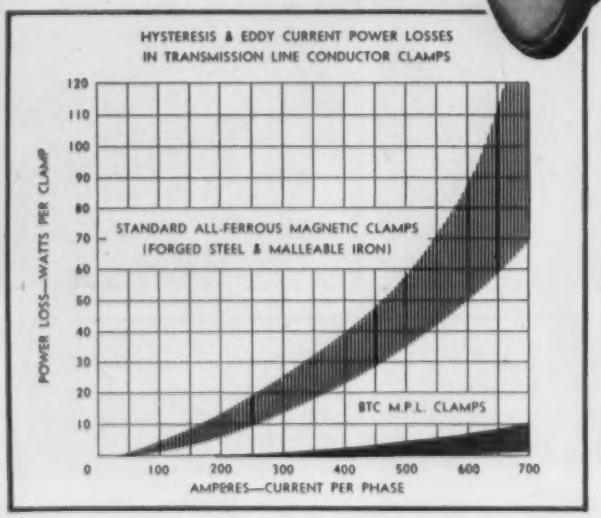
Minimum Power Loss

One of the basic advantages you get with

BTC

Drop Forged M.P.L. ALUMINUM Suspension Clamps





IT'S A FACT...

The use of a non-magnetic Aluminum Clamp Body reduces eddy current and hysteresis losses to a minimum. At the same time, it prevents temperature rise in clamped section of the conductor, which will operate at lower temperature than in the span.

THIS IS JUST ONE of many reasons why it pays to use BTC drop forged M.P.L. Aluminum Suspension Clamps on your transmission lines. Specify these performance-proved BTC Clamps the next time you order from your insulator manufacturer!

Sold Through Your Insulator Manufacturer Only.

Drop Forged BTC *Hi-Line Hardware*

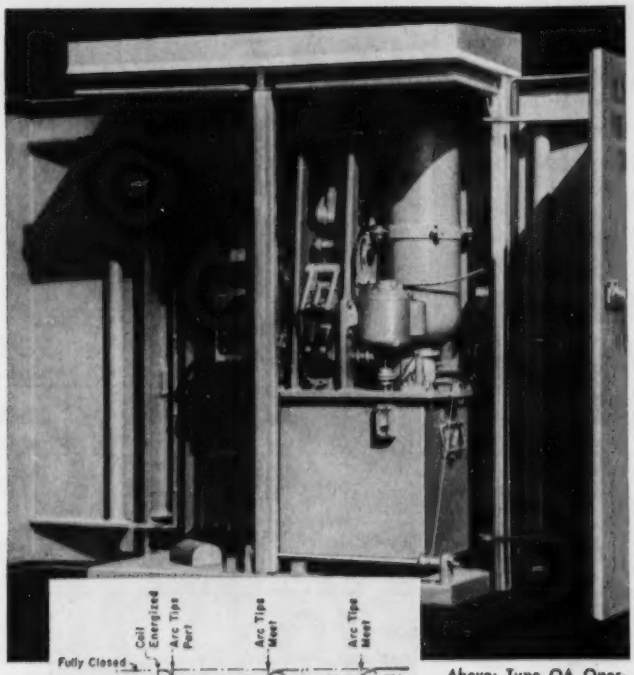
The **BREWER-TITCHENER** *Corporation*

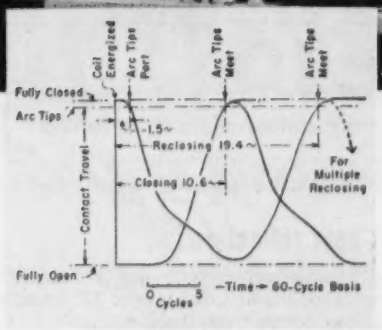
Cortland · New York

Complete Hydraulic Closing for Circuit Breakers

PACIFIC ELECTRIC
Type OA
HYDRAULIC OPERATOR
(Compressed-Gas Accumulator Type)

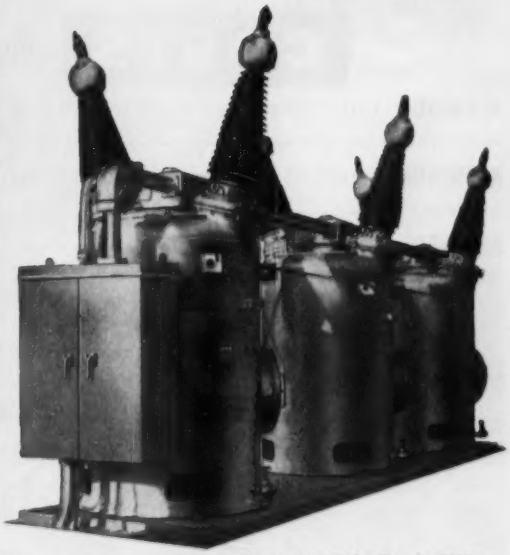
- Compact
- Low Inertia
- Rapid Response
- Smooth Operation Without Impact
- Electrically and Mechanically Trip Free
- Low Maintenance





Above: Type OA Operator in Cabinet with doors open. Shows accumulator and sump tank that contains all hydraulic components.

At left: Typical Time-Travel Curve—taken with oil in tanks. Shows 20-cycle reclosing (for shorter time refer to factory). Five immediate reclosures obtainable, if required, all at same speed.



Above: This 115-kv, 3-cycle, 5000-mva Pacific Electric circuit breaker with Type OA hydraulic operator in use on a leading power system.

SIX YEARS AGO Pacific Electric introduced hydraulic energy transfer as a part of circuit breaker closing. Hundreds of these semi-hydraulic operators (the Type MO-5) are used by leading power systems, from 115 kv thru 230 kv. These operators also embody hydraulic interlocking and hydraulic control of deceleration (which Pacific pioneered years previously). They represent an important part of Pacific Electric's line.

Also six years ago, Pacific Electric started development of a *fully* hydraulic operator because the upward trend of ratings made it desirable to have more powerful operators of smaller physical size.

These new fully hydraulic operators (the Type OA-4) are in production; deliveries to several power systems have been made. Their use in system protective service dates from Sept. 1953.

The new operator has the advantages outlined at the top of this page. A feature is a direct-connected piston-cylinder unit that closes the breaker and that also is the means for decelerating hydraulically both the opening and closing strokes. Hydraulics are also utilized for other purposes—wherever rapid response without impact is a requirement.

For further information, ask for Catalog 587.

Since 1906

SALES OFFICES or AGENCIES in PRINCIPAL CITIES

PACIFIC ELECTRIC SWITCHGEAR DIVISION

FEDERAL PACIFIC ELECTRIC CO.

5815 THIRD STREET • SAN FRANCISCO 24 • CALIFORNIA

SOME FACTS YOU SHOULD KNOW ABOUT ROOFING AND SIDING

Much has been written and said in recent years in comparing various types of roofing and siding. We hope that these facts will help you in obtaining a true analysis of the situation.

COSTS—Prices Per Square Foot In Place*

ALUMINUM (.019", 26 gauge, 2½ x ⅛ or 1¼ x ¼ corrugations on 2" x 4", 18" centers)	**$ .266** per sq. ft.
ALUMINUM (.019", 26 gauge, same corrugations on 1" x 6", 12" centers with building paper)	**$ .305** per sq. ft.
ASBESTOS SHINGLES	**$ .423** per sq. ft.
ASPHALT SHINGLES (210#)	**$ .337** per sq. ft.
NO. 1 RED CEDAR SHINGLES (clear)	**$ .336** per sq. ft.
USS GALVANIZED CORRUGATED STEEL (.019", 28 gauge, 2½ x ½ or 1¼ x ¼ corrugations on 2" x 4", 24" centers)	**$ .180** per sq. ft.

**Based on published figures or cost records of building contractors. Includes labor costs which may vary with area.*

Care and treatment

Contrary to popular belief, all metal roofing requires treatment to prevent rust and corrosion. Most manufacturers recommend that where metal roofing is subjected to spattered oil, condensation or salt air, animal refuse or fumes, the surface and laps should be coated with resinous varnish or asphalt paint. For maximum life, all metal roofing and siding requires care and treatment. Therefore, the much lower initial cost of USS Galvanized Corrugated Sheets becomes of primary importance.

Ease of installation

Width of sheets is, of course, a factor in easy installation. But with USS Galvanized Corrugated steel sheets you don't need expensive nails or special washers . . . workmen aren't nearly as apt to put an accidental hammer blow clear through the sheet . . . and additional scaffolding is rarely necessary, because with steel you have added structural strength.

What about heat reflection?

There is very little difference in the heat-reflecting qualities of any metal roofing at a distance of 12" or more below the roof. Heat comes from three sources—1) radiation from the ground, 2) from the sky, and 3) from horizontal sources (wind, etc.). If heat is a critical problem, the best recommendation is a metal roof with the top exterior painted white, the bottom interior painted black.

Fire resistance

Let's compare the melting points of two metal roofing materials. Aluminum melts at approximately 1218°, steel at 2800°. Thus at 1225° some types of roof are completely destroyed. At the same temperature, however, a steel roof remains intact and relatively unharmed.

These are the facts to keep in mind the next time you need roofing and siding.

For economical, long-lasting buildings, specify USS Galvanized Corrugated Sheets.

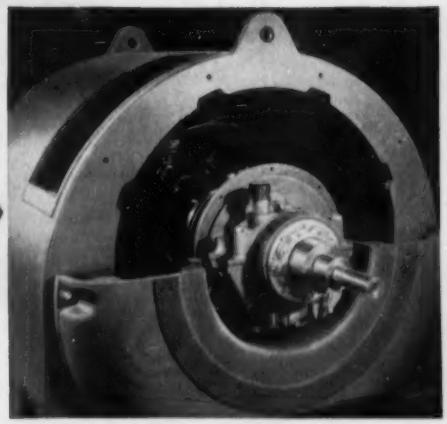
USS Galvanized Corrugated Sheets

United States Steel Corporation • Columbia-Geneva Steel Division

UNITED STATES STEEL

new DESIGN...

more protection with full accessibility



* New Allis-Chalmers slip-ring motor with inspection cover and upper half of end shield removed. Note accessibility of brushes, protection of bearing.

ALLIS-CHALMERS LARGE SIZE SYNCHRONOUS AND WOUND-ROTOR MOTORS have been completely redesigned with longer stator yokes and shorter end shields. Collectors and brushes are located inside the yoke for protection against physical damage, dripping moisture, dust and dirt.

Capsule-type bearings give better bearing protection, too. The upper half of the end shield may be removed for inspection or cleaning of the interior of the motor without disturbing the exciter or exposing the bearing to the ravages of dirt, dust and oil contamination.

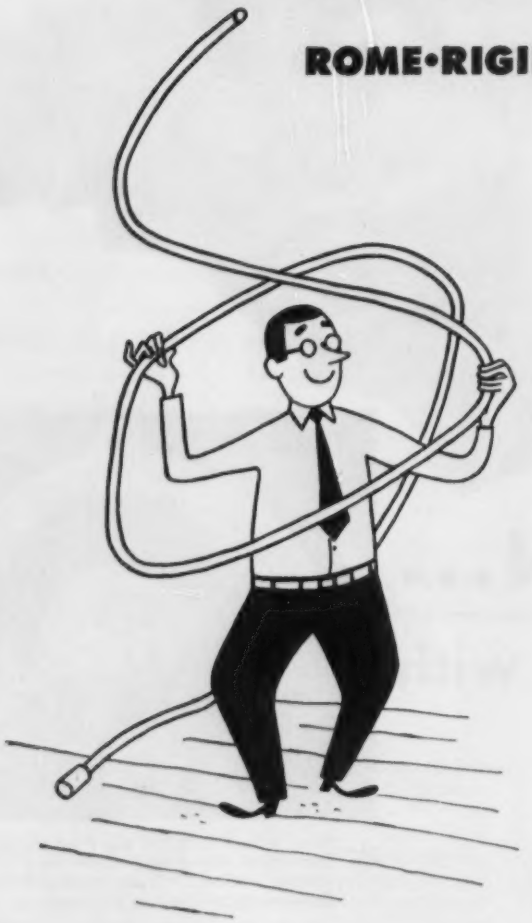
All leads enclosed — Both primary and secondary winding leads are brought out through separate conduit boxes. There is no loose wiring . . . no exposed leads anywhere.

Easy maintenance — Even though the new design offers maximum protection to brushes and collectors, internal parts are fully accessible for inspection and maintenance through large openings in the stator yoke. Opening covers are readily removed and are secured during operation by easy-operating, self-locking fasteners.

Get details now — This new design is available from approximately 250 hp at 300 rpm and up, in drip-proof and splash-proof construction. Call your Allis-Chalmers representative for complete details or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 05R8183. A-4464

ALLIS-CHALMERS

This superintendent found out how good ROME•RIGID steel conduit really is



The superintendent of a large west coast electrical contracting firm found that he could not flake off the galvanizing on ROME • RIGID conduit.

He was bending 1" conduit by hand, but the radius he wanted did not quite come off. So he bent the conduit back and forth *four times* before he was satisfied.

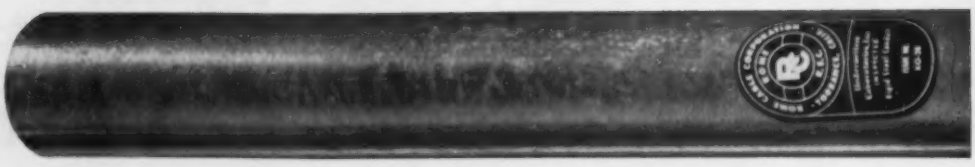
Then he grinned and said, "This is the first time in my experience that I have bent conduit this way without getting distortion or flaking-off of the galvanizing."

Well, Mr. Superintendent (and you, too,) there are some very sound reasons for this. The quality of ROME • RIGID is no accident. Take a quick look at the pains Rome Cable takes to make it a conduit you can install fast, easily, and at low cost . . . a conduit that will provide safe, corrosion-free protection for many years to come.

Mail the coupon to get the complete "Story of ROME • RIGID."

ROME CABLE Corporation
ROME • NEW YORK
and
TORRANCE • CALIFORNIA

ROME • RIGID is made in 10-ft. lengths with a coupling attached in diameters from ½" to 6". Extra couplings and elbows for this complete size range are available. Fully approved by Underwriters Laboratories, Inc., ROME • RIGID meets all requirements for safe steel raceway.



1 The Sendzimir hot-dip galvanizing process *requires* high quality hot-rolled sheet steel, free of heavy mill scale and pits found in "skelp" used in ordinary rigid conduit. We check thickness, hardness and surface quality constantly.

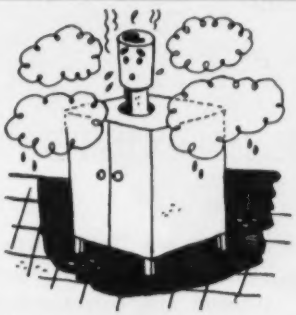
2 To further improve surface quality, we first run the full width of sheet stock through a shot blast. This completely removes all oxides, rust, roughness or dirt, leaving a uniformly clean surface. We then slit the stock to proper widths for the forming rolls which shape it into round pipe.

3 Cold forming maintains the uniform thickness of the steel. As the pipe is formed, electrical resistance welding such as is used in making high pressure boiler tubing, closes the seam with a superior joint.

4 Next, we remove any weld flash inside or out with a scarfing tool and inspect each length for straightness. Any that fail to meet this test, we put on the straightening machine.

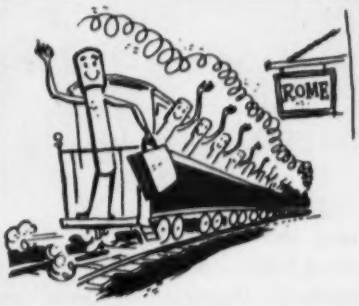
5 Now for the "hot dip." Rome finds the use of Armco Steel Corporation's patented Sendzimir galvanizing process feasible only because the sheet steel Rome uses for RIGID conduit provides the kind of surface this high quality process requires for successful application.

6 First step in the Sendzimir process involves preheating each length in a furnace which, under a carefully controlled atmosphere, burns off any dirt, oil or scale, inside and outside. This treatment produces a blue oxide which makes the inside pipe look like a gun barrel.



7 Next the pipe goes to a reducing furnace which performs two important functions. First, it anneals the pipe, providing a soft, ductile conduit which can be accurately bent. Then, it reduces the blue oxide to a mirror-smooth, stain-free surface.

8 Pipe is then discharged into a molten bath without being exposed to a temperature variation and oxidation. It requires no pickling or fluxing. The pipe is conveyed through a zinc bath, at controlled temperature and time which guarantee a uniformity never before attained in galvanizing rigid conduit.



9 ROME • RIGID is then lacquered inside and out and baked to smooth, hard coating to provide a slick, low-friction surface for easy pulling. 100% of the product then receives inspection, inside and out. Color-coded thread protectors and Underwriters label are applied, and the pipe is bundled for shipment.

ROME CABLE CORPORATION, Dept. WE-12, Rome, N.Y.

Please send me your new brochure, "The Story of ROME • RIGID."

Name .....

Company .....

Address.....

City..... Zone..... State.....

WESTERN SALES OFFICES AND WAREHOUSES

SALT LAKE CITY 1, UTAH
230 South 4th West St.

LOS ANGELES 22, CALIF.
2510 South Malt Avenue

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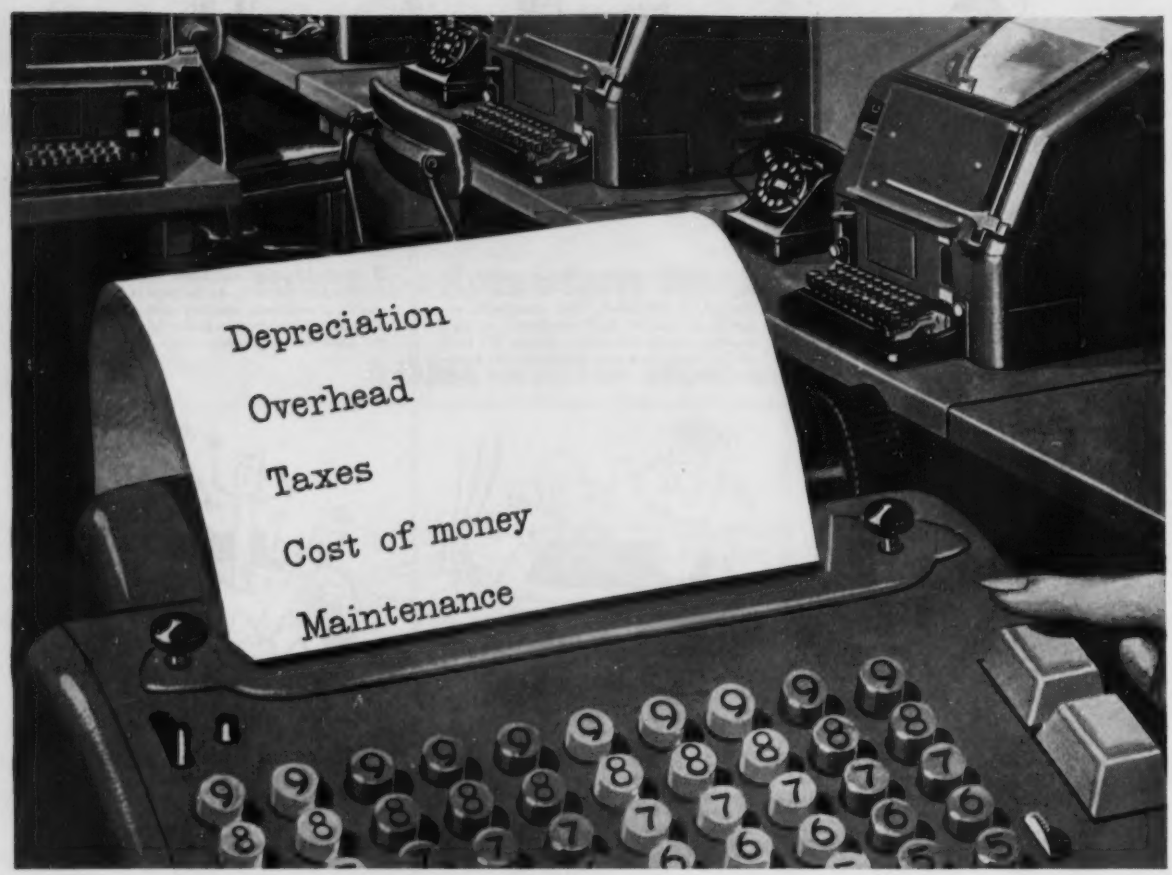
1100 Selby Street

SEATTLE 4, WASH.
3430 Fourth Ave., So.

DENVER 3, COLO.
1160 Blatt St.

PORTLAND 5, ORE.
1020 S. W. Taylor St.



If you provide your own communications system...

HAVE YOU ADDED UP ALL THESE COSTS?

Owning and operating your communications system can be a costly experience, with many costs frequently overlooked. Depreciation, taxes, overhead, maintenance, loss of interest on capital all contribute to your total communication expense.

Bell System communications are low in cost. You pay only a fixed monthly charge for services tailored to your exact needs. No more, no less. Your capital is not tied up but left free for income-producing investments in *your* business.

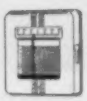
Service has just begun when Bell System communications are installed. Maintenance, replacement, inventory, storage, extension and rearrangement of service are all handled rapidly and efficiently—no longer problems for you.

Let us show you how Bell System know-how and experience can be put to work to solve your communications problems. For a complete communications study, made without charge, call your local Bell Telephone representative today.

PRIVATE-LINE TELEPHONE

TELETYPEWRITER

MOBILE TELEPHONE

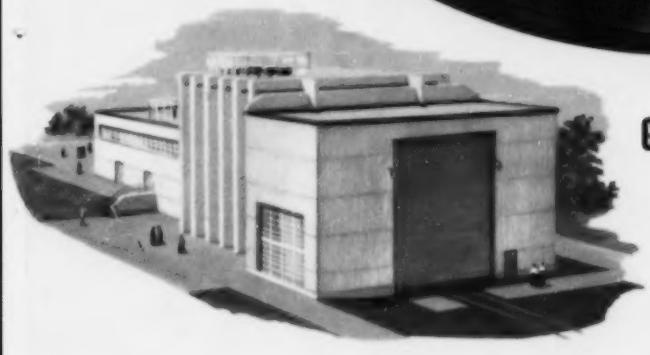

METERING CHANNELS

BELL TELEPHONE SYSTEM

LISTEN . . . to a new weapon in the fight against transformer noise

PLAY this *actual record* on any 78 rpm record player

Tear along perforated line



G.E. tunes you in on a power transformer in the

WORLD'S LARGEST SOUND LABORATORY

for the full story, see inside

GENERAL ELECTRIC

How the new G-E Sound Lab is helping to SOLVE TRANSFORMER NOISE PROBLEMS

The first of its kind devoted solely to the accurate, searching investigation of the sources of transformer noise, General Electric's new Sound Laboratory is already helping to solve transformer noise problems.

Built at Pittsfield, Massachusetts – the center of G.E.'s power transformer research and manufacturing facilities – the new sound laboratory has walls nearly 5 feet thick. How quiet is it inside? The ambient sound level (20 db) represents less than one-millionth of the sound energy you would normally receive as you walk along a busy street. In the awesome silence of the laboratory, microphones and amplifying equipment – sensitive to a mere whisper – detect and measure every characteristic of transformer noise.

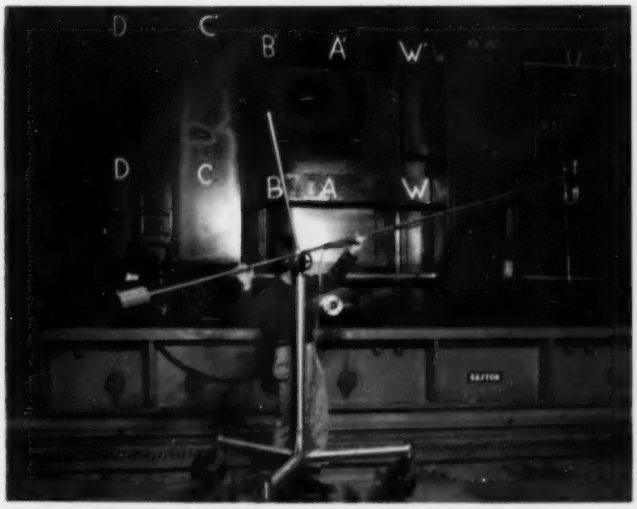
Quieter transformers at lower cost. To make certain that your transformers meet sound level specifications, one of the important jobs of the new laboratory is the precise measurement of the noise levels of power transformers embodying experimental construction and processes. These measurements, accurate to a fraction of a decibel, make possible immediate recognition of the individual small improvements which add up to major progress... and help to bring you quieter transformers at lower cost.

New techniques solve noise problems. Since the ear is more sensitive to certain kinds of noise, complete frequency analyses are being conducted in the new laboratory to pin-point the sources of these irritating vibrations. In other investigations, dynamically-scaled models are used to predict the sound levels of transformers still in the design stage. These acoustic models also help determine the value of barriers and enclosures as aids to noise reduction of transformers in service.

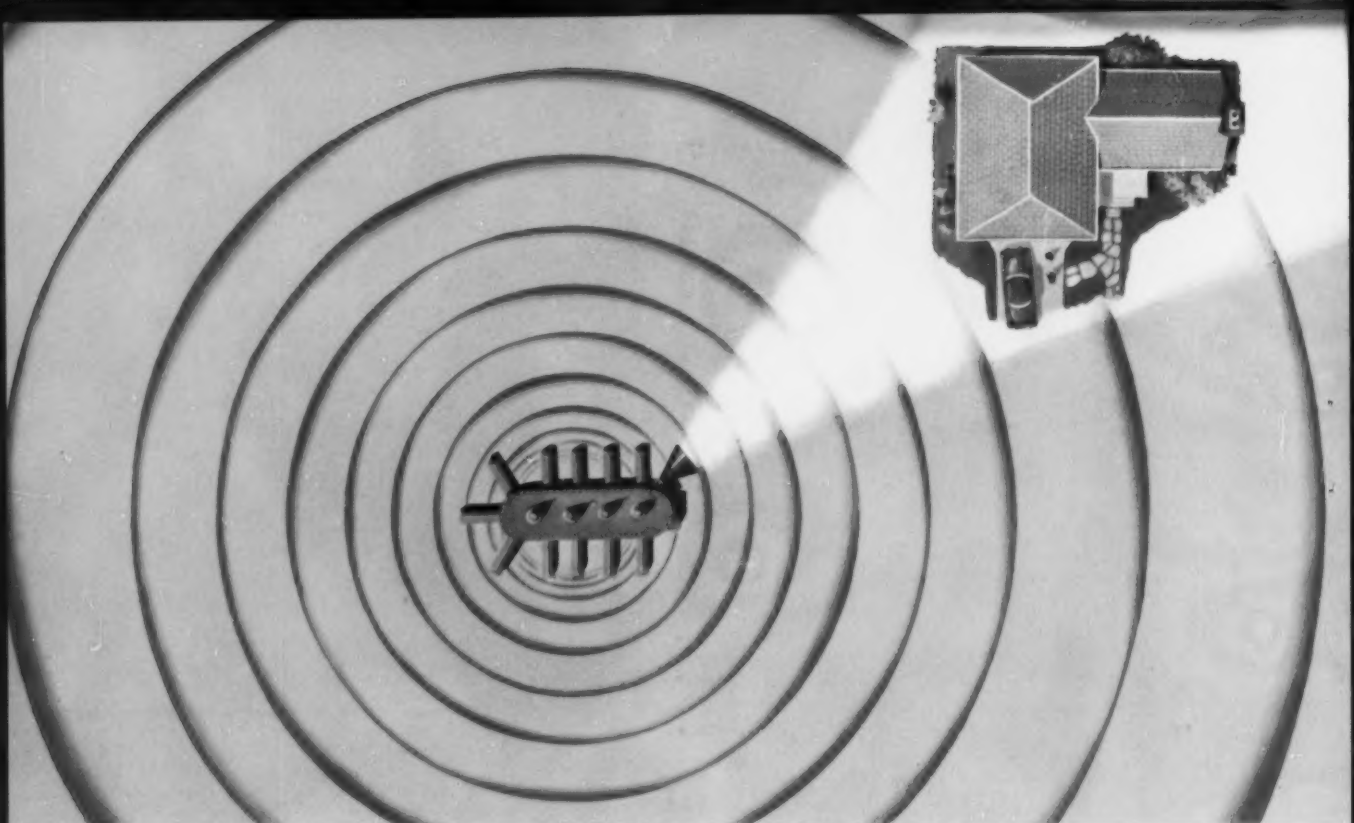
The answers to what to do about noisy transformers in service may take many forms. For example, General Electric engineers have found that one way to hush a power transformer is to *add* a sound source. This apparent paradox is explained on the next page.

GENERAL ELECTRIC

ACOUSTIC MODEL is used to predict the noise level of a transformer still in the design stage and also to check the effectiveness of a sound reduction barrier.

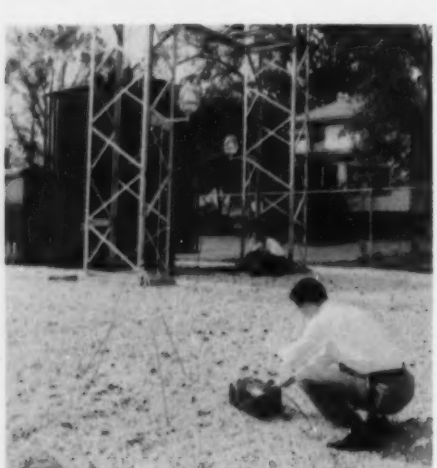


FULL-SIZE TRANSFORMER rated 133,000 kva is given a noise test. Decibel levels are recorded at three-foot intervals around the tank.



LOUDSPEAKER ON TRANSFORMER BEAMS "CONE OF SILENCE" TOWARD NEARBY HOME.

SOUND CANCELLATION . . . a new twist that offers a promising solution for noise problems at transformer installations



FIELD TESTS prove that "Sound Cancellation" is practicable. With loudspeaker turned on, sound level here is substantially lower because the sound waves have cancelled out each other.

Already, the new General Electric Sound Laboratory is contributing to the fight against transformer noise. A new twist on an old idea called "Sound Cancellation" has been worked out in the laboratory. It will help to cure a specific noise complaint under certain conditions by beaming a "cone of silence" away from the transformer.

"Sound Cancellation" is basically very simple. Sound waves from any transformer have certain characteristic amplitude and frequency composition. By sending out another sound beam with identical characteristics—*but opposite in phase*—you can make the sound waves cancel out each other, leaving a "cone of silence."

In practice, a loudspeaker is mounted on the transformer tank and beamed in the direction of an apartment house or dwelling as shown above. By adjusting the volume and phase of the speaker, sound levels have been reduced as much as 15 db at considerable distances (sound energy cut to 1/32 of its former value.)

"Sound Cancellation" is just one of many developments in transformer noise research that you can expect from the new G-E Sound Laboratory in the months ahead. General Electric Company, Schenectady 5, New York.

421-26

Progress Is Our Most Important Product

GENERAL ELECTRIC

Through heart of downtown San Francisco . . .

P. G. and E. Buries New 12-KV Tie-Line 15 Feet Under Sacramento Street

To provide additional power supply for Station "J," located at Sacramento and Liedesdorf Streets, near the center of San Francisco's financial district, the Pacific Gas and Electric Co. is installing a new 12-kv tie-line bewteen "J" and the big Mission Sub-Station at 8th and Mission streets. A new 8-way encased duct system has been constructed, using 5" Soapstone OCT-O-DUCT laid in tiers 2-wide and 4-high. Two 750 MCM gas-filled cables will be pulled in for this new circuit.

Feature of the duct system is the run from Stockton Street down Sacramento to Liedesdorf which was laid in trenches 15 feet below the street surface! Open trench about 3 feet wide was used for most of the run, but night-crews tunneled under busy intersections at Kearny and at Montgomery Streets to eliminate traffic interference.

The unusual depth was required for this stretch of duct in order to avoid the many other underground services present in the area. It is one of the deepest underground runs ever constructed under San Francisco streets. P. G. and E. has used many thousands of feet of Soapstone conduit in its San Francisco underground system. The Mission -"J" tie-line is the first long run of new OCT-O-DUCT laid by this utility.

New Soapstone OCT-O-DUCT has been designed for easy, fast handling in the field. Its low first cost is only the beginning of the economies that Western electric and telephone utilities have been able to effect by using it. OCT-O-DUCT is just the right length for fast erection, even in the deepest and narrowest trenches. Simple collar-type couplings need no field tooling. The electrical, chemical and strength characteristics of this smooth conduit exceed utility and Government specifications.

New Bulletin 54-A tells all about Soapstone OCT-O-DUCT. Also available is a manual of field practices, "How to Install Soapstone OCT-O-DUCT." Write for your copy of either or both of these publications.

SOAPSTONE DUCT COMPANY
110 Linfield Drive, Menlo Park, California
Distributed in the West By
MAYDWELL & HARTZELL, INC.
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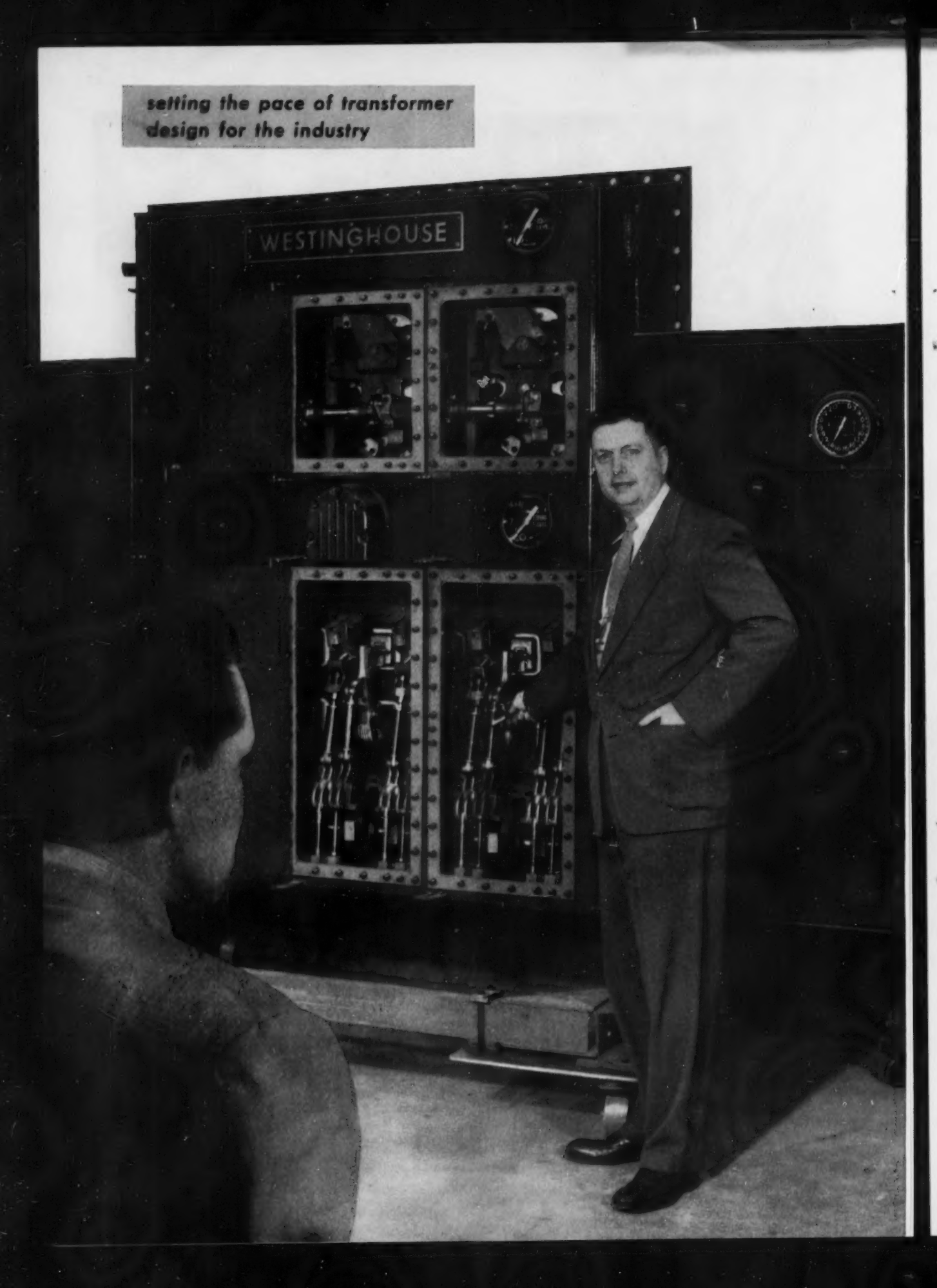
setting the pace of transformer design for the industry



NEW URT TAP CHANGER . . . THE MOST DURABLE EVER BUILT!

300% more fault capacity
200% faster arc quenching

The new Westinghouse URT Tap Changer, for 15,000 through 100,000 - kva power or regulating transformers, combines the rugged construction and proven direct-drive mechanism of the superseded UNR with new features to provide you with the longest, trouble-free service, yet. For instance—

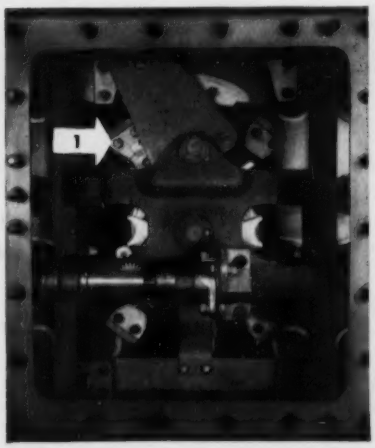
New contact design on the moving contacts of the selector switch and main stationary contacts of transfer switches provides 300% greater current-carrying capacity for operation under fault conditions. It accomplishes this through magnetic attraction between two spring-loaded copper bars with coin silver contacts. Proper contact is maintained for normal loads and as fault current value increases, magnetic attraction between the bars increases contact pressure as needed. Spitting—hot spots—contact welding are thus eliminated.

New arcing switch for the transfer switch assembly decreases arcing time, for example, from a full cycle to one-half cycle—an improvement of 200%. A double-butt arcing contact, with an arcing chamber and magnetic "blowout", makes this possible. The inserts of the main arc tips have a greater than ever life potential.

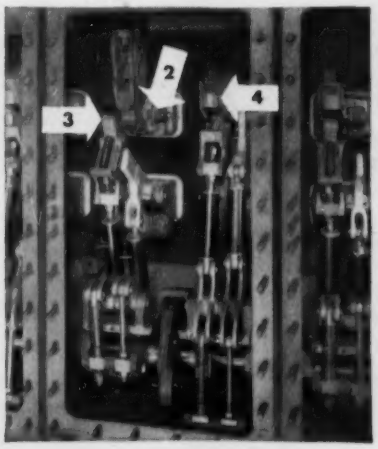
The new URT simplifies inspection, too. Each selector and transfer switch has its individual door—held with stud protecting cap nuts. No more reaching around or through other phase units.

This TCUL development, and the many preceding it, is tangible evidence of the Westinghouse tradition in setting the pace of transformer design for the industry. For more information call your nearby Westinghouse Representative or write Westinghouse Electric Corp., 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

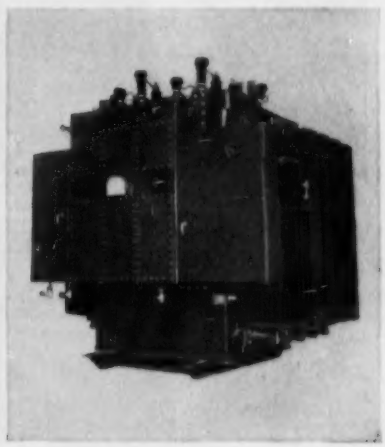
J-70733



300% greater fault-current capacity in this selector switch moving contact (1), and main stationary contact of the transfer switch (2), through principle of magnetic attraction.



200% faster arc quenching is provided by the combination of a double-butt arcing contact (3), arcing chamber and magnetic "blowout" (4) ... for increased contact life.

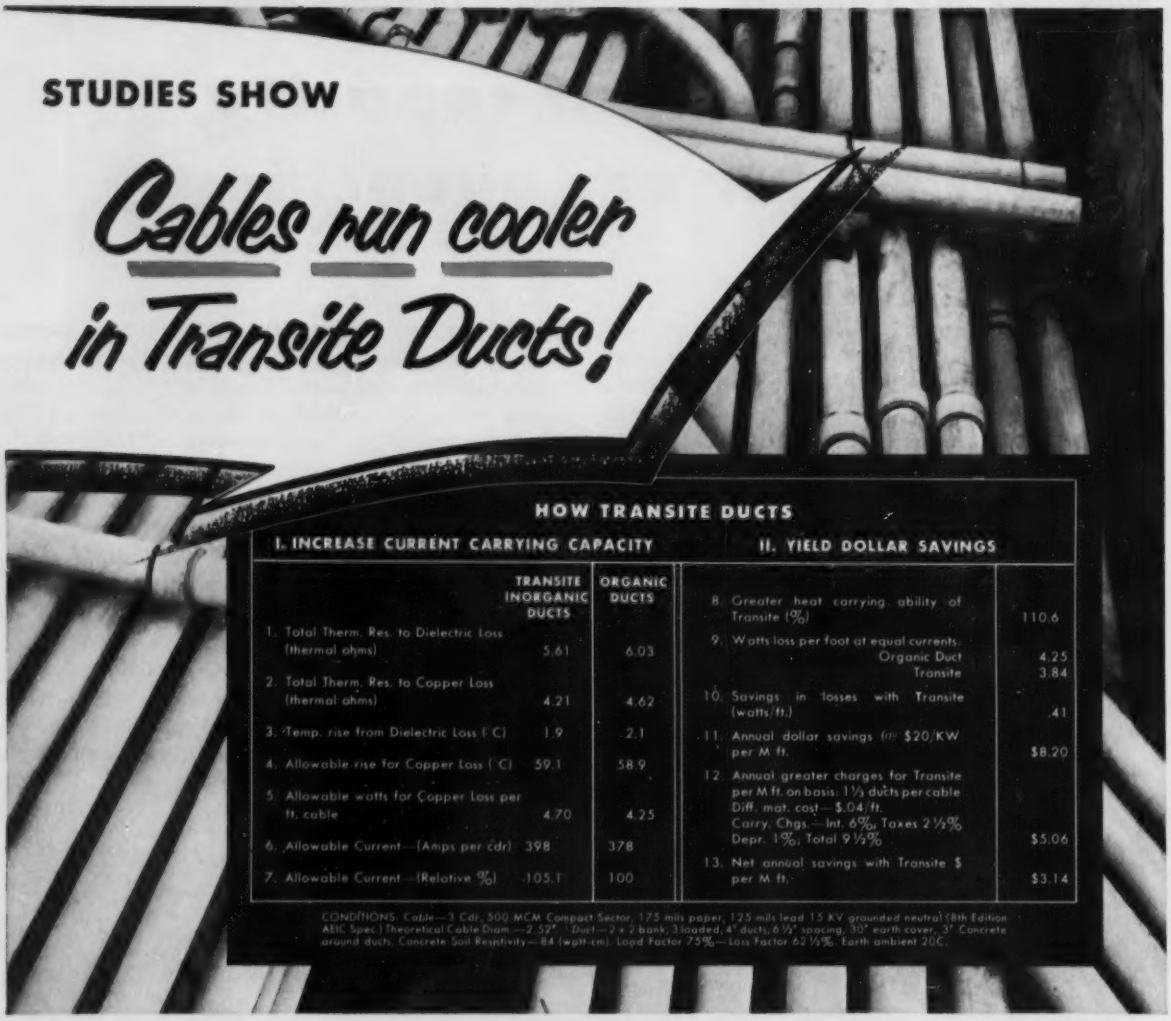


Note single, compact housing for all components of the URT. Front-operated demountable doors individually house all selector and transfer switches.

YOU CAN BE **SURE**...IF IT'S

Westinghouse

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver



HOW TRANSITE DUCTS

I. INCREASE CURRENT CARRYING CAPACITY

	TRANSITE INORGANIC DUCTS	ORGANIC DUCTS
1. Total Therm. Res. to Dielectric Loss (thermal ohms)	5.61	6.03
2. Total Therm. Res. to Copper Loss (thermal ohms)	4.21	4.62
3. Temp. rise from Dielectric Loss (°C)	1.9	2.1
4. Allowable rise for Copper Loss (°C)	59.1	58.9
5. Allowable watts for Copper Loss per ft. cable	4.70	4.25
6. Allowable Current—(Amps per cdr)	398	378
7. Allowable Current—(Relative %)	105.1	100

II. YIELD DOLLAR SAVINGS

8. Greater heat carrying ability of Transite (%)	110.6
9. Watts loss per foot at equal currents: Organic Duct	4.25
Transite	3.84
10. Savings in losses with Transite (watts/ft.)	.41
11. Annual dollar savings @ $20/KW per M ft.	$8.20
12. Annual greater charges for Transite per M ft. on basis: 1⅓ ducts per cable Diff. mat. cost—$.04/ft. Carry. Chgs.—Int. 6%, Taxes 2½% Depr. 1%; Total 9½%	$5.06
13. Net annual savings with Transite $ per M ft.	$3.14

CONDITIONS: Cable—3 Cdr., 500 MCM Compact Sector, 175 mils paper, 125 mils lead 15 KV grounded neutral (8th Edition AEIC Spec.) Theoretical Cable Diam.—2.52". Duct—2 x 2 bank, 3 loaded, 4" ducts; 6½" spacing, 30" earth cover, 3" Concrete around ducts. Concrete Soil Resistivity—84 (watt-cm). Load Factor 75%—Loss Factor 62½%. Earth ambient 20C.

—and copper losses are reduced . . . current capacity is increased . . . insulation life prolonged

TESTS have been made for many years by the Johns-Manville Research Center, to determine how Transite Ducts improve the dissipation of heat by conductors under load. The application of the test results is summarized above.

The figures prove that Transite Ducts will carry heavier current loads than organic ducts when sheath temperatures are the same. The result is a cooler cable under a given load . . . lower I^2R losses . . . longer insulation life from lower operating temperatures.

Transite Ducts offer many other advantages, too. Made of asbestos-cement, they are incombustible, resistant to corrosion, unaffected by electrolysis. When arcing occurs, Transite protects adjacent cables from damage. These durable, light-weight ducts provide complete and permanent cable protection, together with savings on installation and maintenance.

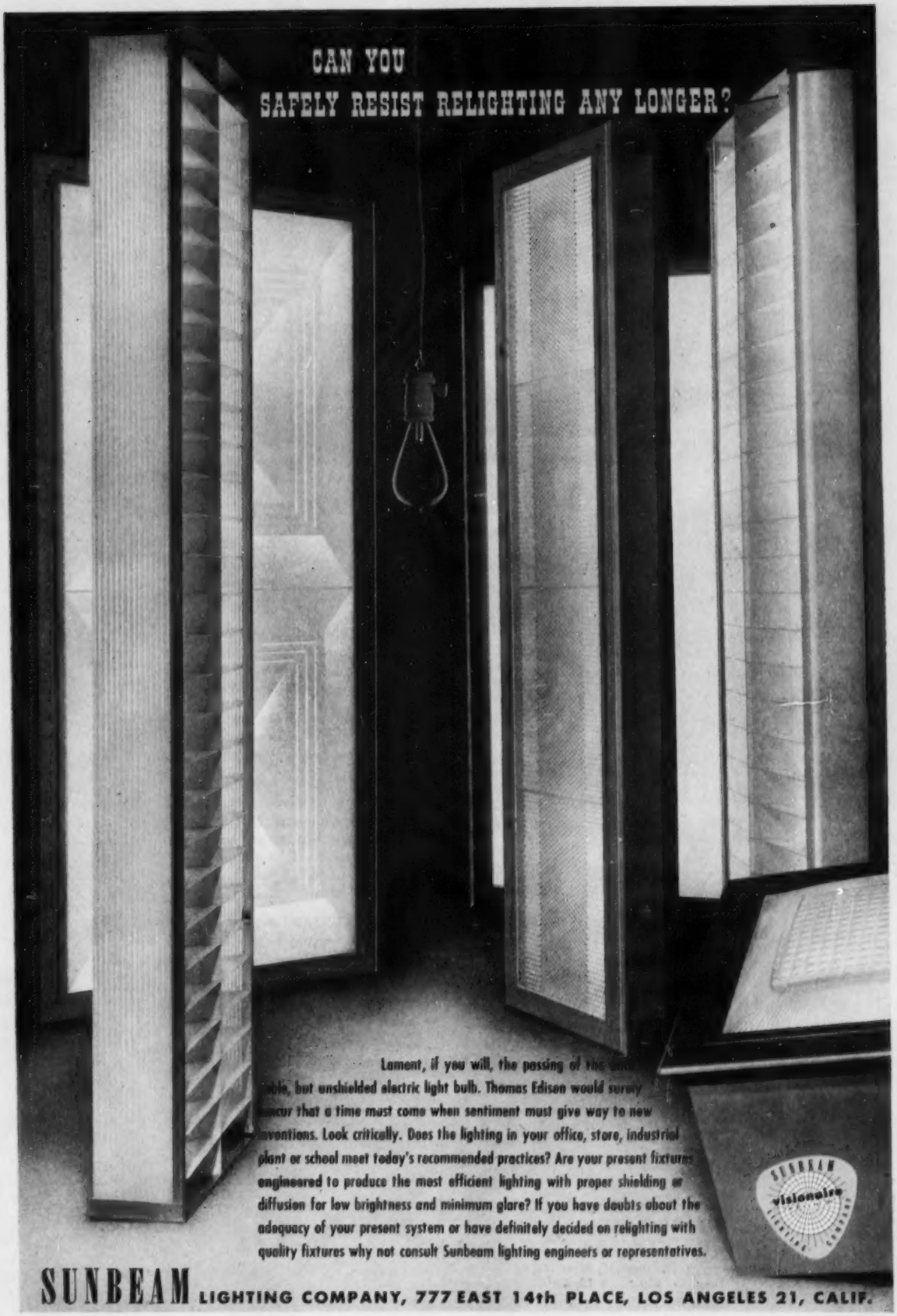
For complete details on these tests and the many advantages of Transite Ducts, write for free copy of Brochure EL-29A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville TRANSITE DUCTS

TRANSITE KORDUCT—for installation in concrete

TRANSITE CONDUIT—for exposed work and installation underground without a concrete encasement


CAN YOU
SAFELY RESIST RELIGHTING ANY LONGER?
Lament, if you will, the passing of the
able, but unshielded electric light bulb. Thomas Edison would surely
ncur that a time must come when sentiment must give way to new
ventions. Look critically. Does the lighting in your office, store, industrial
plant or school meet today's recommended practices? Are your present fixtures
engineered to produce the most efficient lighting with proper shielding or
diffusion for low brightness and minimum glare? If you have doubts about the
adequacy of your present system or have definitely decided on relighting with
quality fixtures why not consult Sunbeam lighting engineers or representatives.
SUNBEAM visionaire
SUNBEAM LIGHTING COMPANY, 777 EAST 14th PLACE, LOS ANGELES 21, CALIF.

POWERS *American*

Series 450 CONSTRUCTION AND OVERHEAD MAINTENANCE BODY

Does the Work of
TWO TRUCKS

Ladder can be revolved 360° at elevations from 30° to 75°. In 23'6", 26'6", and 30'6" mechanical units, or 35' hydraulic model.

Body is 108" long, for installation on dual-rear wheel chassis having cab-to-axle dimension of approximately 60".

Here's a multi-purpose body that does work normally requiring two or more specially-equipped vehicles.

FOR OVERHEAD WORK . . . the body has a Powers-American mechanical or hydraulic Aerial Ladder, in a working height best suited to individual needs.

FOR SERVICE WORK . . . compartments provide space for the orderly storage of a wide assortment of tools and parts.

FOR CONSTRUCTION WORK . . . simplified, easy-to-use derrick handles poles up to 35 ft. in length. A 10,000 lb. underslung winch pays out cable beneath the body floor. A universal swivel sheave permits winch line pull in any direction, without limitation.

COMPLETE DESCRIPTION is given in Bulletin No. 118. A copy, with quotation, is yours for the asking.

Derrick utilizes flexible steel cable instead of conventional center leg. Stows in loading area rack when not in use.

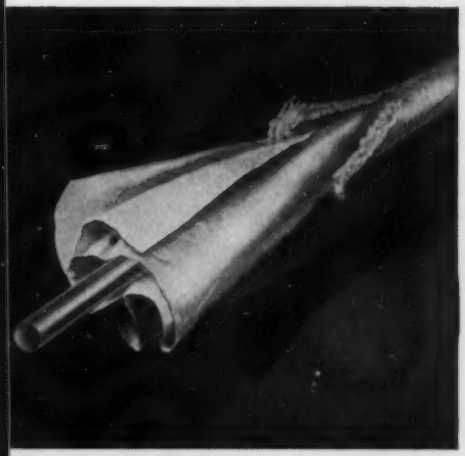
POWERS-AMERICAN DIVISION
McCABE-POWERS AUTO BODY COMPANY
5900 No. Broadway • St. Louis 15, Missouri
428 Latham Sq. Bldg. • Oakland 12, Calif.

WEATHERPROOF LINE WIRE

SLEET AND SNOW severely test line wire. In foul weather or fair, **DURALINE** provides greatest service dependability.

Here's how Anaconda's Duraline protects circuits

It cuts down outages and interferences in rain, snow and sleet



DURALINE* is completely unlike any other weatherproof line wire. It gives the *finest* weatherproofing and has longer life.

Note its continuous sheath of interlocked and felted, fibrous material—thoroughly impregnated with URC saturants and finished with URC finishers. Only Anaconda makes a line wire with this type protection.

As a result, Duraline reduces grounds and shorts in wet, windy and icy weather. It protects against contact with foreign objects. It eliminates festooning.

Ask your Anaconda Sales Office for full information. Or write *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

*Reg. U. S. Pat. Off. 54078

ANACONDA®

Service and overhead distribution wires and cables, bare and weatherproof (neoprene, polyethylene and thermoplastic), including ACSR • signal, control and communication wire • portable cords and cables • mine cables • magnet wire • copper, aluminum and copperweld conductors • wire and cable accessories

QUICK SERVICE FOR GROWING WEST — *Anaconda's integrated plant at Orange, California, assures western industry of quick, sure service on wire and cable for every kind of application. Contact Anaconda Sales Office at: Los Angeles, San Francisco, or Seattle.*

How will you Sectionalize

DO YOU USE SWITCHES THAT CAN

BREAK the CIRCUIT

UNDER ANY CONDITION?

(Except Short Circuit)

NOW YOU CAN JUST PULL THE SWITCH

When emergency strikes . . . when an energized line is down . . . the S&C Alduti enables you to drop the load—all of it—at once!

No need to go through complicated unloading preliminaries . . . no need to open main breakers causing otherwise unnecessary interruptions . . . outages are held to a minimum . . . line repair can go forward immediately.

The S&C Load Interrupter drops the load with no lost time, NO external arc, and with safety to the operator.

HERE ARE SOME OF THE FEATURES YOU'LL FIND IN THE S&C LOAD INTERRUPTER

- Positive, "clean break" switching
- Safety to operators
- Interruption of all load currents and charging currents
- Independence from adverse wind conditions

Only one switch—the S&C Alduti—can give you all of these essential performance features . . . can break the circuit, and do it with NO external arc.

This is why the Alduti Load Interrupter has gained wide preference among power men . . . why leading utilities everywhere specify it for sectionalizing.

S&C

your System?

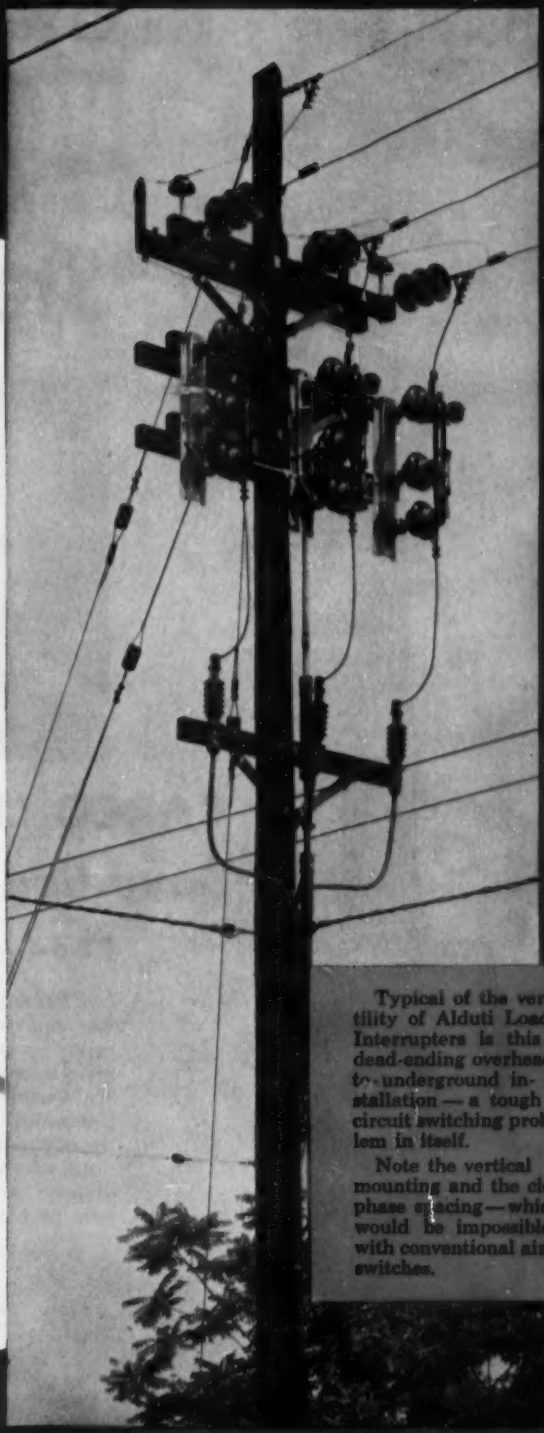
IF NOT, you are missing the kind of operating flexibility you get with the S&C Alduti Load Interrupter . . .

The Alduti Load Interrupter can be operated *any* time . . . instantly . . . without communicating down the line to find out whether load conditions permit switching . . . a very important advantage during storm and emergency conditions.

With the Alduti, switching operations can be carried out without sequencing with circuit breakers—an important advantage during storm or emergency.

And it can drop your *entire* load . . . individual loads never need to be removed as a preliminary.

Interested? Then write today for literature. It will give you new ideas on sectionalizing.



Typical of the versatility of Alduti Load Interrupters is this dead-ending overhead-to-underground installation — a tough circuit switching problem in itself.

Note the vertical mounting and the close phase spacing — which would be impossible with conventional air switches.

ELECTRIC COMPANY

4425 RAVENSWOOD AVENUE
CHICAGO 30, ILLINOIS, U.S.A.

IN CANADA, S&C ELECTRIC CANADA, LTD.
8 VANSCO ROAD, TORONTO 14, ONTARIO

CARCO

Steel Light Poles

CARCO Light Pole Extensions Save Seattle Time and Money

1264 Poles Modernized

PACIFIC CAR'S versatility in the making of steel light poles was demonstrated during Seattle's recent conversion to mercury vapor luminaires in the main business district. Existing metal poles were utilized, signal wiring undisturbed and added height achieved by the use of 1264 Carco fabricated special pole extensions. Installation problems were simplified by designing the new pole extensions to slip-fit over existing lower pole sections after the top had been cut away. Pacific Car's light pole division is geared to help municipalities solve special light pole problems economically.

Standard Carco steel light poles . . . either anchor or transformer base . . . have many exclusive features that make for easy erection and maintenance, strength and permanence. Their versatility permits a wide latitude in mounting heights, bracket lengths and wiring. They are competitively priced and have been installed in many cities in the Middle West and West. We will be glad to help you with your light pole problems. Inquiries are invited.

Write our Light Pole Division for your copy of new catalog on Carco Steel Light Poles. We will gladly send you one on request.

PACIFIC CAR AND FOUNDRY COMPANY

RENTON, WASHINGTON

STEEL LIGHT POLES, RAILROAD CARS, TRACTOR EQUIPMENT: Winches, Logging Arches, Log Carts, Dozers
STRUCTURAL STEEL FABRICATION AND ERECTION, STEEL CASTINGS, FORGING

CARCO®

GET LOWEST INSTALLED COSTS . . . EVERY TIME . . . WITH

GEDNEY CONDUIT BODIES

MALLEABLE IRON—HOT DIP GALVANIZED

YOU CAN'T HELP but cut installation costs with Gedney Conduit Bodies. Every one of them is accurately machined and threaded . . . smooth finished . . . made of unbreakable malleable iron . . . inspected for complete perfection. On top of that, they're special hot dip galvanized to assure absolutely top life on the job . . . and they come in all types and sizes from ½" to 4"

AMONG GEDNEY'S COMPLETE LINE ARE:

TYPE LB—Threaded—for heavy wall rigid conduit. Used with Gedney entrance fittings, straps, clamp backs, etc., you get an *entire* conduit system with hot dip galvanized finish.

TYPE FS—Threaded—shallow bodies for heavy wall rigid conduit. Only Gedney gives you hot dip galvanized as standard finish . . . no corrosive deposits on threads to slow down work and hike costs.

NO MATTER WHAT your requirements may be, there's always the right Gedney body and fitting for the job. To cut installation time and costs and assure long-run dependability, specify Gedney, always.

GEDNEY FITTINGS FIT

GEDNEY
ELECTRIC COMPANY

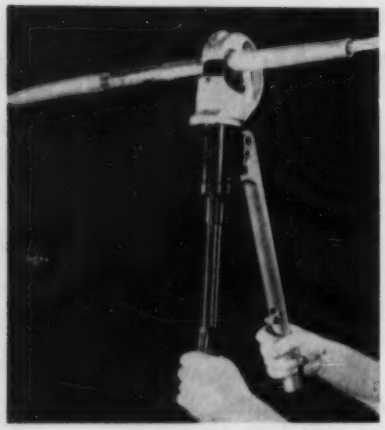
GEDNEY

RKO BLDG. • RADIO CITY • NEW YORK 20
Foundry, Factory and Shipping Point: Terryville, Conn.

PRODUCT NEWS

Hand Tool Has 12-Ton Thrust

(1) Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.



A compressor with a 12-ton thrust for installing accessories on ACSR and aluminum conductor as large as 350,000 cm will be on the market soon. Designed primarily for use on distribution line conductors, the 11-lb tool is easily operated without removing hands from its handles, the manufacturer states. The opening between the press dies is quickly closed by a twist of one handle. Thereafter a minimum amount of effort is necessary to complete the compression stroke, it is pointed out. A pressure release trigger, located at the handle grip, automatically retracts the dies.

The C-head, which holds the dies, can be rotated 180° to facilitate operation in limited working space. According to the manufacturer, a hand line may be attached easily to the compressor so that it may be hoisted into position and hooked over the conductor. Both half-dies, which are identical, are held in place in the tool's head so that the compressor can be moved along the compression fitting without shifting the dies.

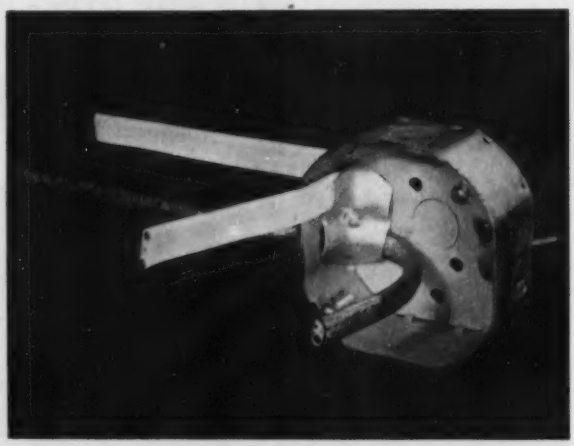
The tool has nylon pump packing and an integral pressure relief valve. The metal case provided will accommodate the compressor and a full complement of interchangeable dies.

The press will be available with or without insulated body and handles. Insulation adds about 1½ lb to the weight. The compressor also may be used with hot sticks.

Spray for Aluminum Connections

(2) Burndy Engineering Co. Inc., Norwalk, Conn.

An aerosol spray compound called Peneseal is said to protect all aluminum-to-aluminum and aluminum-to-copper service connections; to be nontoxic, nonflammable, nonirritating. This compound completely seals the connections, maintains low contact resistance by counteracting the effects of oxide film and prevents galvanic corrosion, it is pointed out. It is applied to the connection as a foamy spray, eliminating brush application. The foam quickly changes to a tacky, self-healing transparent film, giving permanent protection to the connection without affecting conductor insulation, the manufacturer states. Peneseal comes in 12-oz cans and may be applied in temperatures ranging from 20 to 120 F.



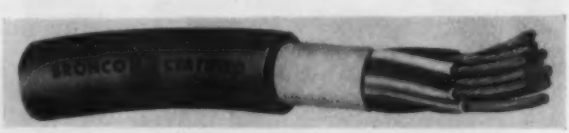
Cable Box Has New Style Clamp

(3) National Electric Products Corp., Gateway Center, Pittsburgh, Pa.

This newly designed 4-in. octagon cable box has a new style clamp and integral ears for loomwire nonmetallic sheathed cable. Designated catalog No. 2761, the box is formed of 14-gage steel, electrogalvanized finish; is 1½ in. deep; has ½-in. knockout and four holes in back for fixture stud and nailing.

Priouts take cable sizes 14/2, 14/3, 12/2 and 12/3. In addition the sides have 2½-in. knockouts. All knockouts are flush and smooth and are easily removed, it is stated. Specially designed NT clamps grip cables firmly and cables enter from side or rear in such position that they are kept free of the edges of the knockout.

The two-piece formed steel box has a slightly recessed back that gives a little when nailed to keep a constant tension against the underside of the nailhead. UL listed, the box is available also with ears, side bracket or bar hangar mounting.



Control Cables

(4) Western Insulated Wire Co., 2425 E. 30th St., Los Angeles 58, Calif.

These flexible control cables with from 5 to 24 conductors are being made in sizes 18 through 10 AWG. Conductors in the new Bronco 60 Certified control cable are of pure, annealed electrolytic copper for maximum flexibility and flex life, it is stated, and insulation over the conductors is heat-resistant type RH rubber. Singles are coded with permanent colors.

The outer jacket is certified to contain not less than 60% new neoprene by weight — equivalent to 65.46% by volume. The jacket is branded every two feet.

No utility has ever "bought" a Watthour Meter

You see, to our way of thinking, a utility does not "buy" watthour meters—it invests in them. Watthour meters are the instruments through which an electric power company's revenue is determined. Don't you agree that purchasing them is really an investment . . . an outlay of capital with the view of obtaining an income or profit?

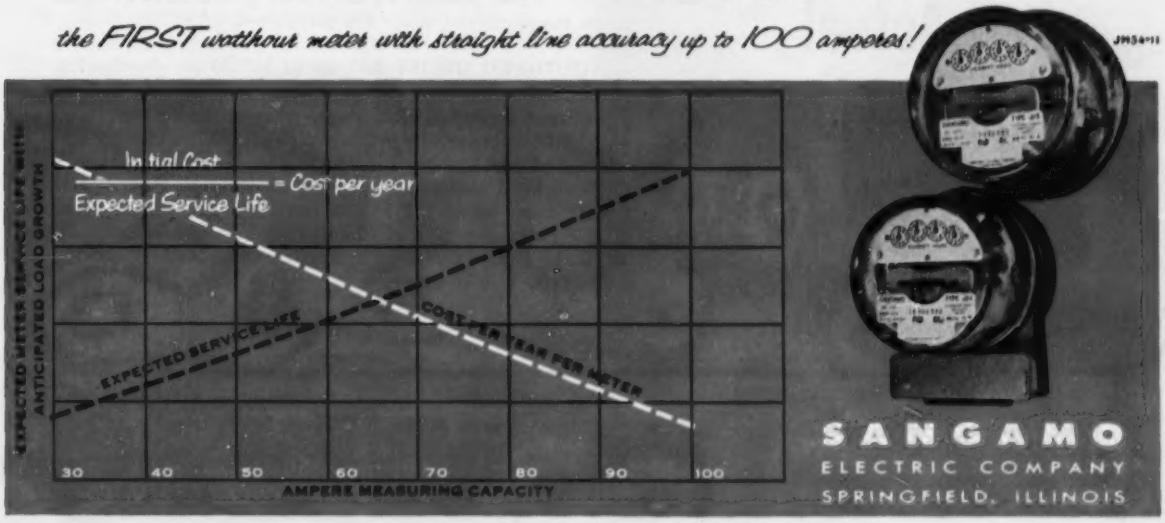
Over two hundred utilities with more than 25,000 customers on their lines have *invested* in nearly ¾ million J2 Meters since last March.

And their investments are protected because the J2 was designed specifically *to meet any future load growth.* If you divide the many years of service you can expect from a J2 Meter into its initial cost, the J2's cost per year is very low.

So when it comes to meters, choose the Sangamo J2 Watthour Meter, the first and finest 15 ampere meter with 100 ampere capacity . . . the meter that protects your investment in metering and lowers investment costs.

the FIRST watthour meter with straight line accuracy up to 100 amperes!

JM54-11



SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

Save up to 8% on Power

Many utilities discover new economies with standardized designs... lower initial cost, shorter shipment, easier and faster installation

ALLIS-CHALMERS POWER Transformers

Three Purchasing Case Histories Tell Actual Dollar Savings Possible

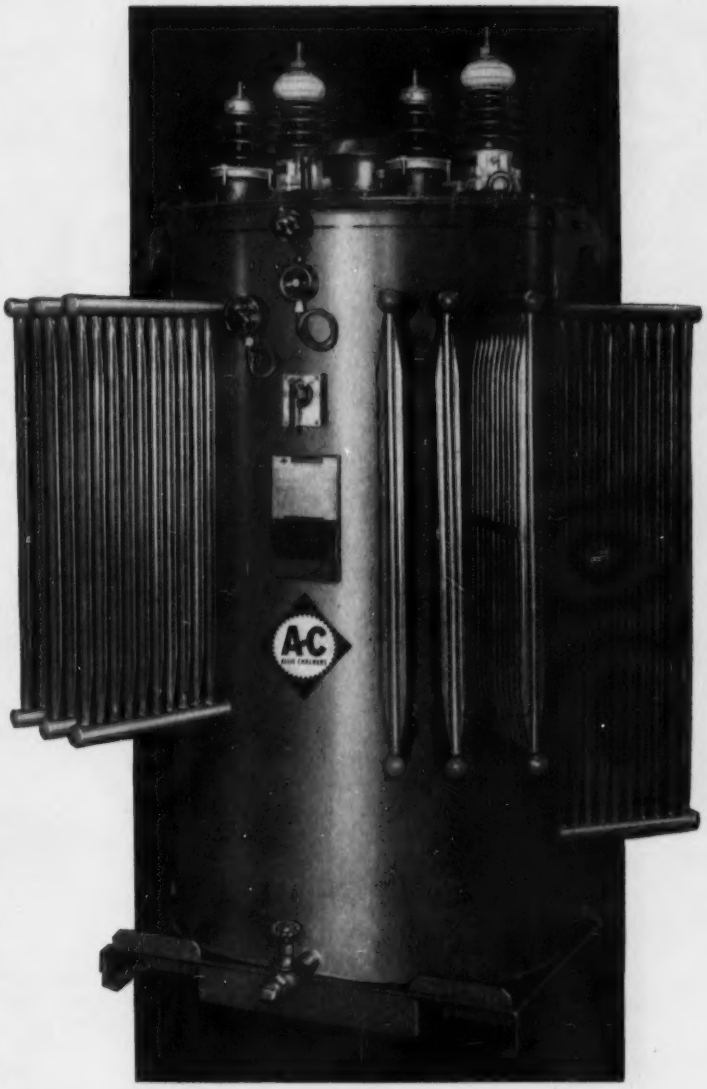
1 **A MIDWEST UTILITY SAVED** $6,065.00 on one purchase of an Allis-Chalmers standardized unit on which it was possible to choose a different rated high voltage. For years this utility had purchased transformers with rated high voltage 66,000 delta and four 2½% full capacity taps below normal. By rating a standardized unit with high voltage of 62,700 and full capacity taps of 66,000-64,350-61,050 and 59,400 — a standardized unit was purchased at an approximate savings of 7%.

2 **AN EASTERN STEEL COMPANY SAVED** $1,920.00 with an Allis-Chalmers standardized unit. The new transformer, high voltage 67,000 volts, low voltage 7200 volts, will operate at 6900 volts at slightly reduced kva. This makes possible operation in a bank with an existing 6900-volt transformer. This customer foresees even greater savings when more standardized units are purchased.

3 **A SOUTHERN UTILITY SAVED** $1,557.00 by purchasing Allis-Chalmers standardized power transformers. It was found that three 1667-kva single-phase transformers rated at 13,200 voltage delta with two 2½% full capacity taps above and below normal to low voltage 2400/4160Y could be paralleled satisfactorily with existing non-standard transformers rated 1667 kva having a high voltage of 13,200 delta and taps at 12,540-12,210-11,880 to low voltage 2300/4000 wye (the transformer to be over-excited for 2400/4160 wye output).

ALLIS-

Transformers



Allis-Chalmers standardized design power transformers offer utilities attractive savings in time and money compared to special designs. Standardization eliminates or reduces engineering and manufacturing time, results in savings up to 8% of the total cost of a transformer. Delivery can be made faster than with special transformers. Installation is simplified by standardized location of accessories. If certified drawings are required, they can be obtained immediately in many cases.

Other Features Available

Manufactured in accordance with NEMA and ASA C57.12a Standards, these transformers are available in ratings up to 5000 kva single phase and 10,000 kva three phase. Considerable flexibility is available too. Other features include variations in primary voltages, junction boxes, different types of oil preservation, as well as other mechanical and electrical features.

It will pay to get complete details on savings made possible by Allis-Chalmers standardized transformers. Call your nearby A-C district office or write Allis-Chalmers, Milwaukee 1, Wisconsin, for more information.

A-4429

A-C ALLIS-CHALMERS

CHALMERS

New Splicing Method for Field Use

(5) Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.

A new splicing and insulating method for use in the field requires no heat; involves embedding the splice in liquid epoxy resin that hardens into a hermetically sealed casting. Used in kit form, it allows the workman in the field to turn out a tough, plastic-jacketed splice in a matter of minutes, completely protected and insulated against moistures, corrosion and electrical leakage, the manufacturer states.

Basis for the new method is Scotchcast electrical embedment resin No. 4, now available in a plastic, mixing envelope, which is claimed to give a virtually foolproof method for mixing resin and hardener in the right proportions.

Applications have included street and airport lighting cable, communications cable and splices in insulated conductors above and under ground, as well as completely submerged in water.

All materials needed to make a complete cast splice in single-conductor cable from wire sizes 10 to 4 AWG are included in the kit, No. 82A. No tools except a pocket knife are required. Each kit makes one splice and includes a supply of Scotchcast resin and hardener in the Unipak container; a three-piece vinyl plastic single-use mold; two different sized Scotchlok electrical spring connectors; a strip of abrasive cloth for cleaning the conductor; an instruction sheet.

Average properties of Scotchcast resin No. 4 used in the kit include a dielectric strength of 800 v per mil thickness in 10-mil films; an electrolytic corrosion factor of 1.0; a dielectric constant and dissipation factor at 30 C of 7.2 and .019 respectively; good resistance to water. oil, solvents and weathering. The material is self-extinguishing.

Aluminum Alloy for Bus Conductors

(6) Kaiser Aluminum & Chemical Sales Inc., 1924 Broadway, Oakland, Calif.

A new aluminum alloy for electrical bus conductors, designated 55EC, was developed to combine the high strength characteristics of 6063-T6 with conductivity approaching that of EC-H17. The manufacturer states that, because of its greater structural strength, it will be useful in applications where short circuit forces are high and that the high strength characteristics also give a more favorable creep rate.

The new alloy is available in many structural shapes and in both rectangular and tubular conductors; is said to be adapted to use in panelboards, switchboards, bus duct, isolated-phase bus and other bus conductor functions.

It can be plated and welded as easily as other aluminum bus conductor materials and bolted electrical connections prove as reliable as those made with other electrical conductor alloys, the manufacturer states. Tolerances conform to the present standards for rectangular and tubular bus conductors.

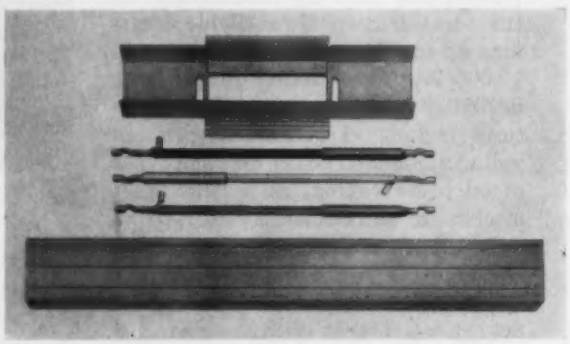
Crimping Tool for Compression Service Connections

(7) Burndy Engineering Co. Inc., Norwalk, Conn.

For installing all compression service connectors in the manufacturer's Crimpit line, the new MD3 Hytool is described as a light weight, inexpensive hand tool with four separate crimping grooves accommodating a wide range of conductor and connector sizes.

It weighs 8 lb and is 24 in. long; features a compound cam and toggle action that develops a high mechanical advantage and delivers 9,000 lb of indenting force with a single stroke.

The MD3 is constructed of high-strength steel alloys; is short handled with rubber hand grips. It is available also with wooden handles.



(8) FITTING—Switch-controlled multioutlet assemblies can be mounted directly to outlet boxes with this new fitting introduced by National Electric Products Corp., Gateway Center, Pittsburgh 30, Pa. Designated CF3-629, the new outlet box cover comes furnished with three splicing jumpers and insulator tubes ready for crimp-on connection to the assembly. It was developed as a cover plate on device and outlet box feed installation when using the manufacturer's type CF3 switch-controlled Plug-in Strip. The product is UL listed.

For Additional Information Fill in the Coupon on Page 52

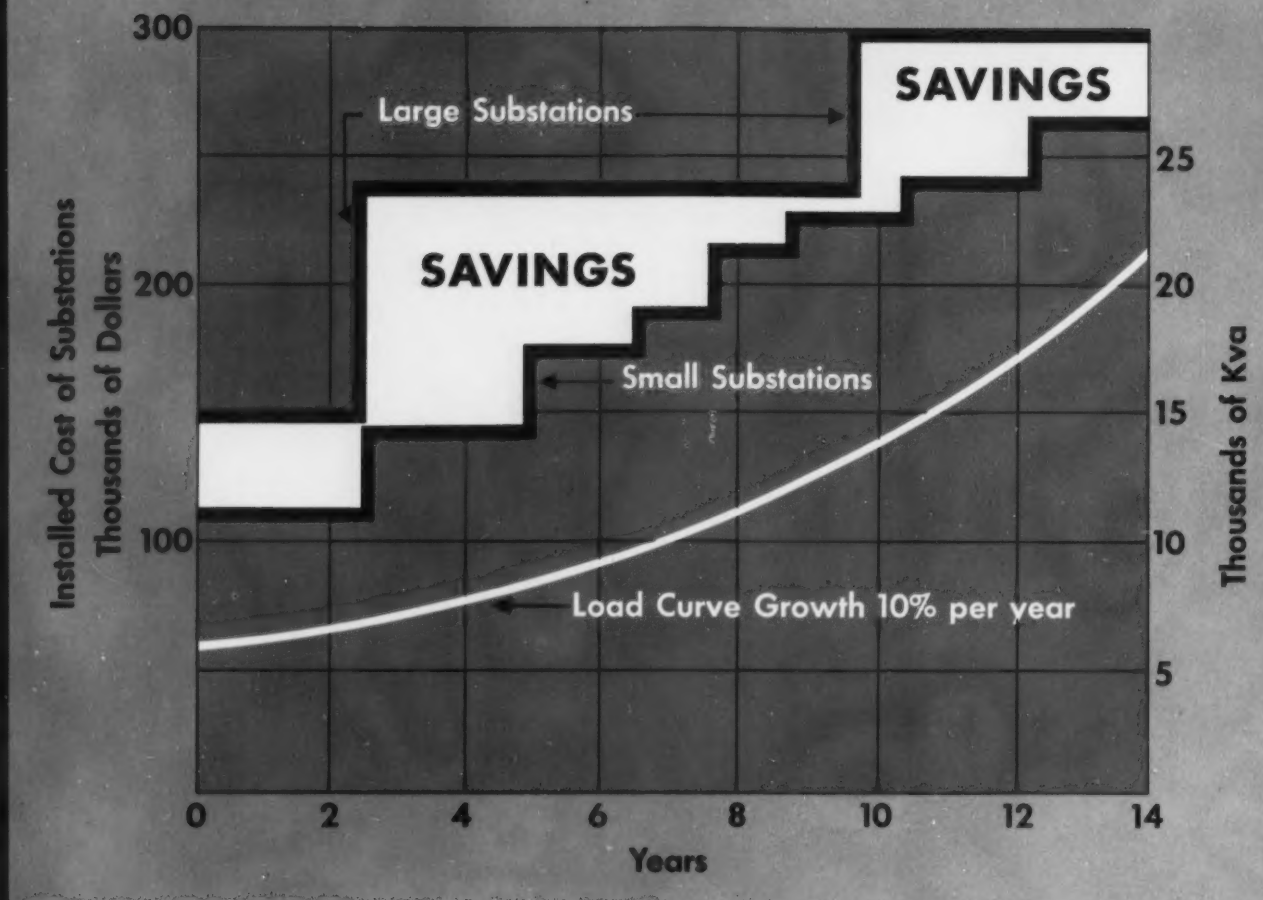
THE CREATIVE LANDSCAPING AND SAFETY FEATURES OF THIS P. G. & E. SUBSTATION PAY OFF IN COMMUNITY GOOD WILL.

P. G. & E. uses unit substations where appearance and safety really count

In residential areas, utilities like Pacific Gas and Electric are faced with the problem of economically meeting load growth with substations which do not detract from the attractiveness of a neighborhood, and which do not present a safety hazard to residents, especially children. General Electric unit substations have helped P. G. & E. meet these requirements.

The smooth compactness of G-E unit substations is designed to upgrade the appearance of neighborhood landscapes. Complete metal enclosures and underground cable connections make them safer even near unsupervised playgrounds. In many cases, this permits installation with consequent savings in areas where conventional substations would be prohibited.

GENERAL ELECTRIC



THE "BUILDING-BLOCK" METHOD cuts costs of meeting load growth. Adding capacity in small "blocks-of-power", by advance ordering of master or package substations for delivery when needed, substantially reduces the overall system investment. This chart shows how the addition of small unit substations, rather than large substations with over-large reserve capacity, creates real savings. This chart assumes that load growth can be predicted accurately. Actually, this is seldom possible. If load growth is erratic, however, savings will generally be even greater. When load unexpectedly drops, the "building-block" system is even more worthwhile, providing insurance against excessive unused power. Unused capacity, in the form of these smaller unit substations, can readily be moved to meet load growth in another area.

BEHIND THE HEDGE and attractive fence is a G-E unit substation which matches the landscaping of surrounding homes. Certainly nothing here detracts from the neighborhood's natural attractiveness.

THIS RUSTIC STOCKADE might easily be a private fence for a modern home in a semi-rural area or suburb. Actually, it is an attractive and inexpensive way of disguising a unit substation by imaginative landscaping.

Why and how P. G. & E. uses factory-assembled standard substations

Factory assembled substations have helped Pacific Gas and Electric Company keep pace with the tremendous post-war load growth on the west coast. The company has standardized on several types of factory-assembled substations, designed to meet specific requirements of its service areas. Their sound ordering policy anticipates future load growth. As the load grows, sites will be selected and these substations will be ready for installation. *Thus, P. G. & E.'s customers will be supplied with the power they need when they need it, efficiently and economically.*

In addition to these basic economic advantages of the "building-block" approach to system expansion, P. G. & E. realizes many other benefits from the use of factory-assembled substations.

Compact units present a very attractive appearance, as contrasted to the patchwork look of substations erected piecemeal in the field. Complete metal enclosure helps protect operators against accidental contact with live parts. Positive interlocks prevent removal of breakers unless they are in open position. Shipped in two or three sections, General Electric unit substations can be installed easily by simply bolting them together and connecting power leads.

The installed cost is low, and more important, *predictable*. There are no "extras" to buy. Substations manufactured on a repetitive basis assure maximum savings and fastest shipments. Purchasing is simplified because there is only one specification — one purchase transaction. New orders can be placed without further engineering or specification writing.

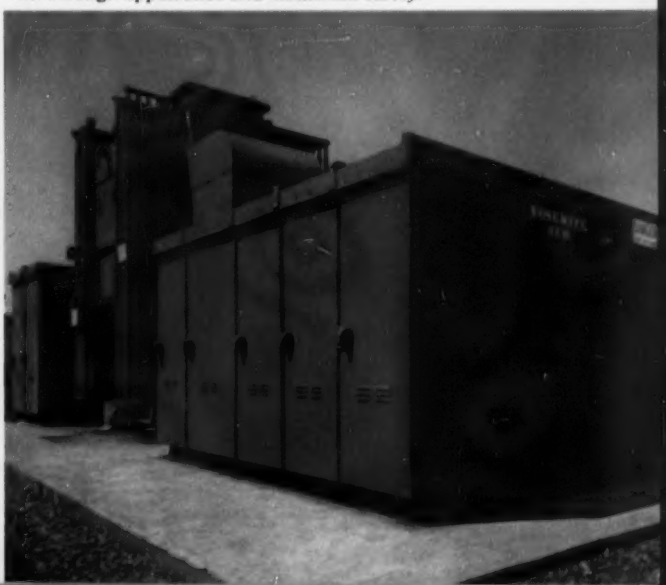
Conservatively designed for long, dependable service, the unit substation offers over-all service reliability of a high order. As it usually serves a relatively small load area, outages or damage to any of its elements involve only local service disruption and minor expense. Little installation space is required — its compactness permits strategic location close to load.

Because master unit substations are basically standard designs, each unit incorporates years of engineering effort. This results in a design that is closer to perfection, and produces coordination impossible to achieve in piecemeal operations.

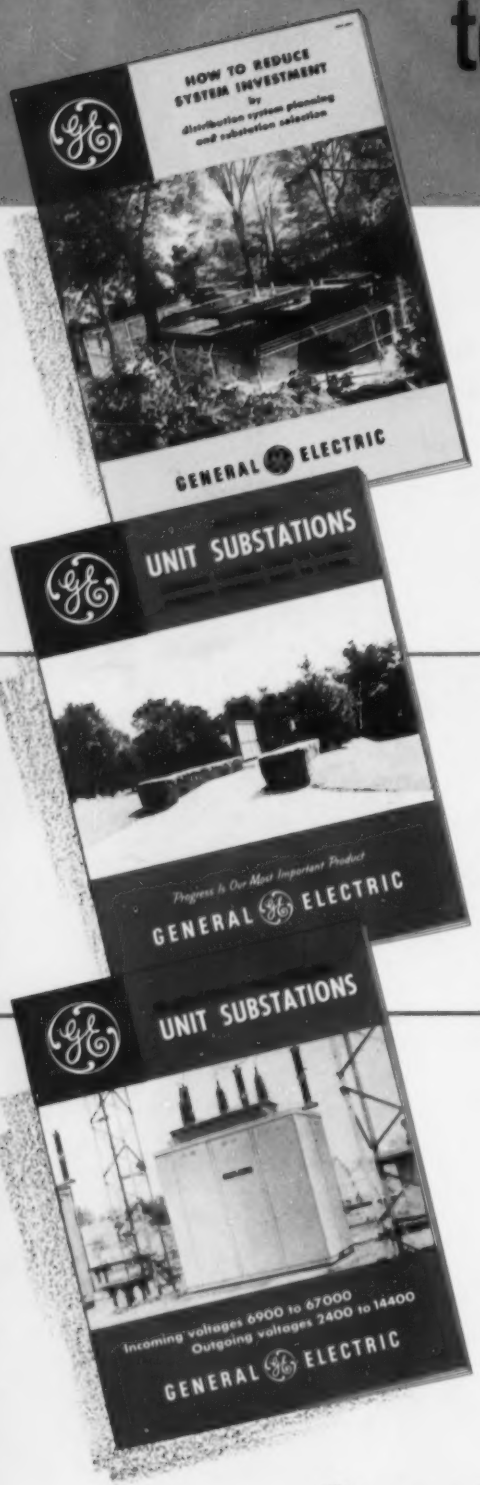
GENERAL ELECTRIC

IN THIS COMMERCIAL AREA, a G-E unit substation has been fronted by a simple brick wall which keeps it in character with surrounding buildings. This unit costs far less than an indoor station with protective building.

THIS G-E MASTER UNIT SUBSTATION, rated 4000 kva, is a "standard" unit in P. G. & E.'s program of "building-block" expansion to meet rapidly growing loads. It promotes good will through appearance and maximum safety.



These useful G-E publications explain today's substation story



HOW TO REDUCE SYSTEM INVESTMENT

On a national scale, electric utilities are now spending approximately one billion dollars a year to assure adequate distribution facilities. Since the early 1930's, the distribution system has represented the largest single item of utility investment. This manual shows you how best to face today's constantly mounting construction costs.

For over two decades General Electric has encouraged advance system planning through application of ready-to-install package substations, factory-engineered and factory-built. The building-block approach to system planning is examined in detail as a means of reducing distribution system investment. For your copy, contact your nearby G-E Apparatus Sales Office, or write for bulletin GEA-5847. Address Section 512-1, General Electric Company, Schenectady 5, N. Y.

MASTER UNIT SUBSTATIONS

This publication provides a complete description of G-E Master Unit Substations. It includes a discussion of time and money factors, and describes a variety of high-voltage arrangements. The proven design features of G-E transformers are shown in detail, as well as the maximum protection provided with G-E metal-clad switchgear.

Layouts, weights, dimensions and complete guide form specifications are included. For your copy, contact your nearby G-E Apparatus Sales Office or write for bulletin GEA-3800C. Address Section 512-1, General Electric Company, Schenectady 5, N. Y.

SINGLE-CIRCUIT UNIT SUBSTATIONS

General Electric single-circuit substations of the integral type are particularly applicable to low density areas or small spot loads in the range of 1,000 to 5,000 kva. They are of the single bus, radial feed type. All components are coordinated and assembled within one housing making a single compact unit, ideal for temporary or seasonal loads, suburban areas, new developments, and coordinated load building programs.

For your copy of the bulletin contact your nearest G-E Apparatus Sales office, or write for Bulletin GEA-4300 and GET-1977. Address: Section 512-1, General Electric Company, Schenectady 5, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Wire Markers

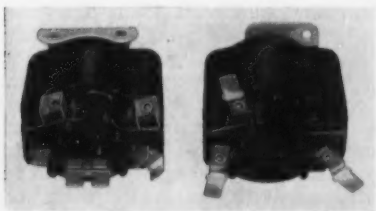
(9) W. H. Brady Co., 727 W. Glendale Ave., Milwaukee 12, Wis.

Wire markers claimed to withstand continuous heat to 300 F, intermittent heat to 450 F and continuous cold to –300 F are mounted on dispenser cards treated with a release coating. It is necessary only to zip off the protective coating and peel the markers from the card. These markers are stocked in two sizes: 1½ in. long for wires over ¼ in. O.D. and ¾ in. long for small-gage wires. Bulletin 130-B gives details.

Fittings

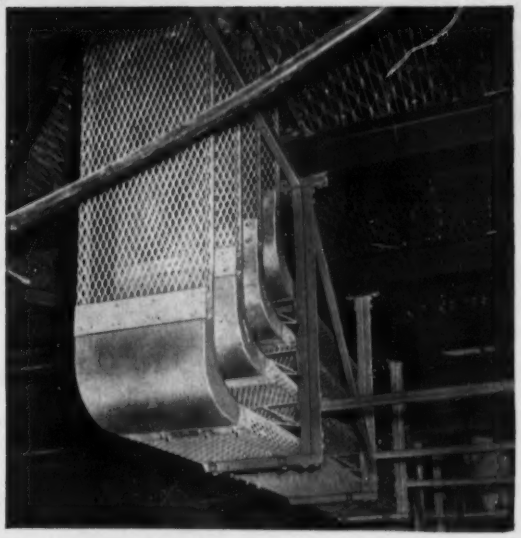
(10) Gedney Electric Co., RKO Bldg., Radio City, New York 20, N. Y.

The new 90° Pull-In Ells and 90° Pull-In Adapters may be used to convert straight box connectors into 90° connectors or as 90° box connectors for rigid standard pipe coupling. They permit a straight pull in both directions, it is stated. Both fittings come with gasketed cover and are made of malleable iron, cadmium plated.



(11) QUICK DISCONNECT TERMINALS—Male quick disconnect terminals are now available on potential motor starting relays made by R-B-M Division of Essex Wire Corp., Logansport, Ind. They come with either horizontal or vertical connections. The relay on the left shows the maximum terminal arrangement available.

Cope CABLE TROUGH



Etiwanda Steam Station Southern Calif. Edison Co.

for efficient and continuous support of power and control cables

Cope Cable Trough is a completely designed, standard system of flattened expanded metal trough especially designed to give continuous support to power and control circuits. The system is light but strong and can be quickly and easily erected at the job site from completely prefabricated units.

A wide range of fittings such as tees, elbows, dropouts, etc. is available which allows changes of direction and elevation to be easily made.

Installation is extremely simple—the only tools needed are a few wrenches—and once in, the trough, being hot dip galvanized after fabrication, requires practically no maintenance but is accessible should cables ever need to be inspected or replaced.

Write today for further details. Ask for Bulletin 12H.

You know Cope by these products

Cope

T. J. COPE, INC.

711 SOUTH 50th ST. • PHILADELPHIA 43, PA.

Western Representatives

Los Angeles, Calif.—*H. J. Randolph Co., 736 S. Santa Anita St., San Gabriel*
Portland 4, Ore.—*J. E. Edstrom, 319 S. W. Washington St.*
San Francisco 11, Calif.—*George E. Honn Co., 420 Market St.*
Seattle 1, Wash.—*Fred W. Carlson, 2307 5th Ave.*

Distribution Transformers

(12) Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

A completely redesigned line of distribution transformers is said to have improved electrical characteristics, improved sealing, fewer parts and to be smaller in the larger ratings. The new line will be built in single-phase ratings from 3 to 167 kva, 15,000 v and below. Three-phase ratings will range from 9 to 150 kva, 15,000 v and below.

The larger ratings have been designed to have the shortest possible wall heights and still meet EEI-NEMA requirements. Height reductions range from 22.7% for 25-kva ratings to 13% for 37½- and 50-kva ratings.

According to the manufacturer, almost 40 external bolts, clamps and lugs have been eliminated in the cover-bushing transformers by improved tank and handhole covers. The tank cover is secured through a clamping arrangement, consisting of a single bolt threaded into an internal beam support. In addition, the single bolt through the center of the cover provides improved sealing by applying uniform pressure throughout the entire circumference of the corprene gasket. As load and temperature conditions change, this pressure is constantly maintained by the spring action of the dome cover.

New hanger and lifting lugs have straight sides that are protection-welded directly into the tank wall. A step-type core design permits winding the coil closer to the core, giving a shorter mean turn in the coil. A single-piece top end frame for the smaller ratings and a wrap-around frame for the larger ratings give an improved method of supporting the core and tying it securely to the tank wall, it is stated.

The units also have new high- and low-voltage bushings and new lightning arresters and arrester mounting brackets.

Illustration shows the 15-kva 2,400-v design.

Load Banks

(13) Mullenbach Electrical Mfg. Co., 2300 E. 27th St., Los Angeles 58, Calif.

New calibrated load banks may be secured in portable, semiportable and stationary form with lagging, unity or leading power factors for local or remote control operation. They come for use with 400 cycle to direct current in ratings to 120 kva. Exhaust fans are provided where necessary. Calibrations are normally plus or minus 10% but closer tolerance can be furnished. Bulletin 6010 gives details.

F Lamp

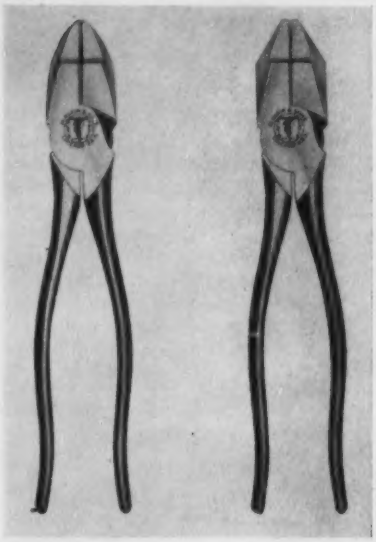
(14) General Electric Lamp Division, Cleveland 12, Ohio

A rapid-start fluorescent lamp claimed to produce higher light output than existing types without sacrificing life is being introduced in the 96-in. length 1½-in.-diameter size. A 72-in. lamp will follow.

Because it operates efficiently at low atmospheric temperatures, it is expected to prove popular for out-of-door as well as indoor applications, the manufacturer states.

The lamp features a new lamp base incorporating two recessed contacts in a single element. This gives convenient push-pull lamp insertion without sacrificing safety, it is claimed.

(15) PACKAGED COMPONENTS — Square D motor starter modification and replacement components are now being packaged. The cover-mounted push button illustrated is typical. Other packaged components include selector switches, interlocks, overload relays, coils and repair parts. According to the manufacturer, standard motor starters become more flexible since modification is simplified through easy identification and availability of needed parts. Manufacturer's address is 4041 N. Richards St., Milwaukee 12, Wis.



Cutting Plier

(16) Mathias Klein & Sons, 7200 McCormick Road, Chicago 45, Ill.

This lineman's plier was designed for clean and easy cutting of insulated and hard drawn bare wire. High leverage is provided without extra hinging, eliminating need for widespread width of handles, the manufacturer points out. The new tool serves also as a regular side-cutting plier.

The plier measures approximately 9 in. over all and opens to take No. 2 weatherproof hand drawn solid copper wire. It also will cut ACSR. It comes in either regular (No. 213-9) or streamlined (No. 213-9NE) patterns.

Solenoid Valves

(17) Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.

A new line of two-way solenoid valves, designed for compactness, may be used for controlling flow of air, gas, water, light oil and other noncorrosive fluids. They are available normally closed or normally open, with standard, watertight or explosionproof solenoid enclosures.

According to the manufacturer, the normally closed valve is only 3 13/16 in. high and 2¾ in. face to face. Pipe sizes are ⅜, ½, ¾, 1 in. Maximum pressure (a-c): 250 psi on air (normally open), 200 psi on air (normally closed). These valves may be used on all standard a-c and d-c voltages. Power consumption is 10 w. Details in bulletin 8210A.

(18) EXPLOSIONPROOF FLOOD—A portable floodlight for use in hazardous areas is offered by the Safe Lighting Inc., 91-03 Astoria Blvd., Jackson Heights, N. Y. UL listed.

Connect lights with but a simple twist

Imagine the convenience and savings. With BullDog Universal Trol-E-Duct® in your plant you can move lighting fixtures in minutes, even shift around your entire lighting arrangement . . . without rewiring, without downtime, without spending an extra nickel for electrical materials.

That's because Trol-E-Duct provides an outlet every inch along its length. To connect a light, all you do is insert a twistout plug or mobile trolley anywhere into the bottom of the duct. To add extra lights, just attach more fixtures and twist in connections while the current is on. There's no downtime. No conduit or cable to install or splices to be made. No special supports to change or buy, either. BullDog Universal Trol-E-Duct both *feeds* and *supports* lighting fixtures. Ideal for light duty or portable hand tools, too.

Investigate Universal Trol-E-Duct for your company. It is far easier and faster to install than fixed wire and conduit systems. It pays for itself many times over in convenience and in *cash saving* it creates by eliminating downtime and materials waste.

See your electrical contractor for full details, or write to BullDog Electric Products Company, Detroit 32, Michigan. Ask for Bulletin UT-650. Export Division: 13 East 40th Street, New York 16, New York. In Canada: BullDog Electric Products Co. (Canada), Limited, 80 Clayson Road, Toronto 15, Ontario. ©BEPCO

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

Coast Electric & Manufacturing Co., 1733 N.E. Seventh Avenue, Portland 12, Ore. • BullDog Electric Products Co. of Los Angeles, 2885 E. Washington Blvd., Los Angeles 23, Calif. • Safety Switchboard Company, 910—89th Avenue, Oakland 21, Calif. • Young Electric & Mfg. Co., 2134 Curtis St., Denver 2, Colo.

Porcelain Products' service mast KIT

Everything furnished

but the house and conduit

for

Ranch type homes

Available Now!—a Service Entrance Mast kit complete to every detail—including roof flashing. Even necessary bolts, nuts, lag screws, and nails. These articles make up the new Porcelain Products' service mast kit that you'll put up and forget. All components of the kit can be *installed by an electrician, with electricians' tools.*

Here is a list of the parts:

- √ 1¼" UL approved Service Entrance Cap
- √ 1¼" to 2" Bell Reducer to adapt service cap to conduit
- √ Galvanized Roof Flashing and Storm Collar
- √ Roof Mounting Plate of new and original design
- √ Conduit hanger with 2¼" lag screw attached
- √ Slip-fitting offset reducer with interior grounding device
- √ All necessary bolts, nuts, lag screws and nails
- √ *Plus*—Porcelain Products famous 2061-C Pipe Mounting house brackets as specified.

Write for details today!

60 years **Porcelain Products, Inc.** PP INC.
FINDLAY, OHIO

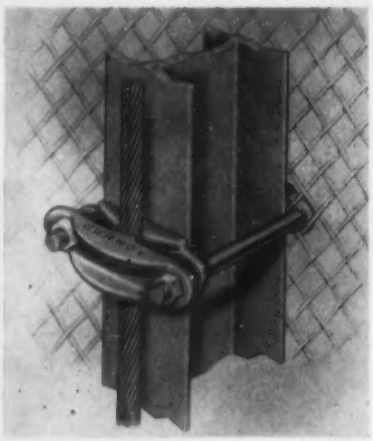
Air Conditioner

(19) Westinghouse Electric Corp., Sturtevant Division, Dept. 237, 200 Readville St., Hyde Park, Boston 30, Mass.

A new multizone air conditioning unit is designed to supply the individual temperature and humidity requirements of as many as 12 zones in a building, regardless of variations in construction, changes in occupancy, wind or solar exposure.

It is of the blow-through type and forces air over either cooling or heating coils or a combination of the two. The required air quantities and temperatures are regulated through the positioning of sets of interconnected hot and cold air dampers in the coil section discharge.

The unit comes in seven sizes ranging from 1,665 to 21,000 cfm.



Grounding Clamp

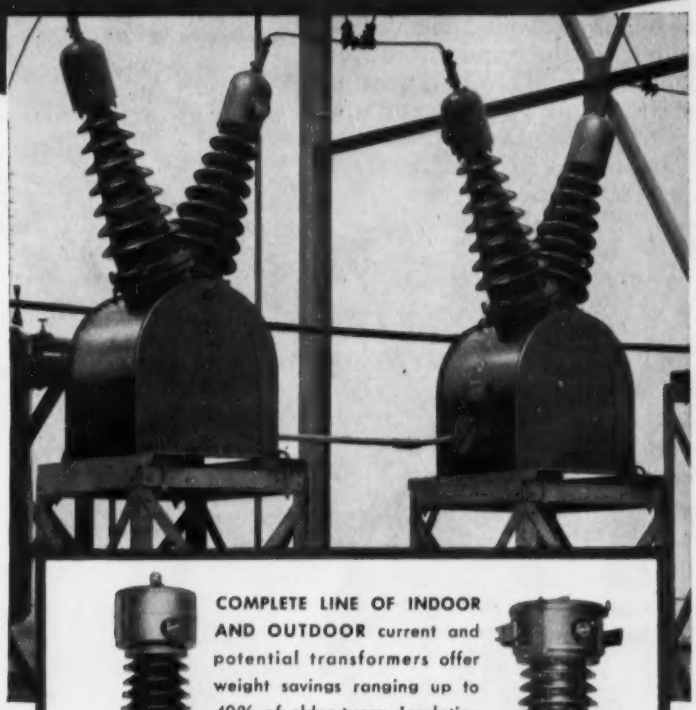
(20) Burndy Engineering Co. Inc., Norwalk, Conn.

This new grounding clamp, type GA-H, was developed to meet the increasing grounding requirements for H-beam fence posts. This clamp is of high copper alloy, designed with slots in the casting to allow lateral movement of the bolts, permitting installation of different H-beam widths. It accommodates the more popular H-beam fence posts from 1⅞x1⅞ to 2½x2½. Bolt heads are recessed and captured in the slots allowing single wrench installation. The GA-H takes a conductor range of No. 4 solid through 250 MCM copper cable.

(21) **WARNING SIGNAL** — A portable signal has a flashing amber light that can be seen from any angle; is powered by a storage battery that has a built-in charger. Made by General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.

These potential transformers weigh 800 lbs less than older types

SAVE TIME...SAVE SPACE ...SAVE STRUCTURE



ALL THAT IS NEEDED to lift these 69-kv potential transformers into place is a set of rope blocks — thanks to the savings in weight made possible by new Allis-Chalmers designs. In addition, they take up less space, require less foundation structure than other types of potential transformers.

Corona-Free Design Provides High Insulation Strength

The units are corona-free. They have high insulation strength and high thermal ratings. Long-time overvoltage tests have proved all voltage classes.

Construction Sturdy

Tanks are all-welded, hermetically sealed to protect insulation and oil from sludge formation. Unique bushing construction permits circulation of oil through the bushing and transformer, reducing oil requirements and permitting reduced transformer sizes.

It will pay to get all the facts on weight savings and quality design and construction of Allis-Chalmers current and potential transformers. For your copy of the technical paper "PT's Are Getting Smaller," consult the A-C office nearest you or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4483

COMPLETE LINE OF INDOOR AND OUTDOOR current and potential transformers offer weight savings ranging up to 40% of older types. Insulation strengths are greater and thermal ratings higher than could previously be provided.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

FROM

Every Angle

THEY'RE DEPENDABLE

OHIO

MOTOR AND GENERATOR BRUSHES

Thousands of industrial concerns have availed themselves of our product and the recommendations of our engineering staff. Send your motor and generator brush problems to us and we will prove to you that when you buy "OHIO" you buy DEPENDABILITY.

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West Coast Representative
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Los Angeles 13, Cal.

THE OHIO CARBON COMPANY

12508 BEREA ROAD • CLEVELAND 11, OHIO

Motors

(22) General Electric Co., Small Integral Motor Department, Schenectady 5, N.Y.

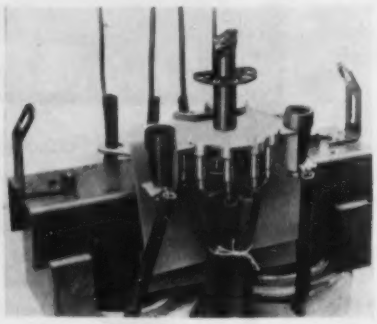
Rerated Tri-Clad 55 polyphase induction motors are available in ratings from 1 to 5 hp, NEMA frame sizes 182, 184, 213 and 215. All ratings come in totally enclosed models as well as dripproof enclosure.

Available in sample quantities are the 7½ and 10 hp ratings, NEMA frames 254U and 256U in dripproof and totally enclosed fan-cooled enclosures.

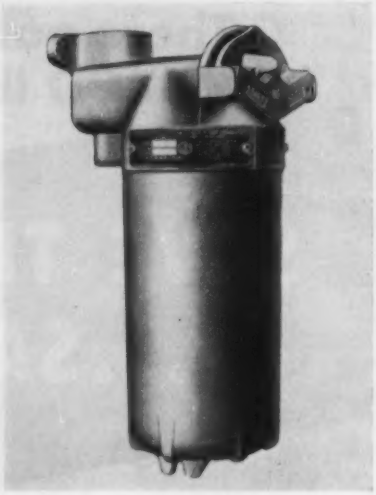
Inspection Plates

(23) Industrial Products Co., 3012 N. Fourth St., Philadelphia 33, Pa.

For use in aerial inspection of transmission lines in rural areas, inspection plates are made with a single digit so that any combination of numbers may be arranged. Although they are generally supplied in 6x5 in. with black numbers on a yellow background, any size or color combination can be supplied on order. They are made of 18-gage steel and finished in porcelain enamel.



(24) TAP CHANGER — A tap changer now installed in LM round-wound distribution transformers rated 100 kva and smaller has a body of great strength, both mechanically and electrically, according to the manufacturer. This is obtained through use of a molded alkyd resin reinforced with glass fibers. It is said to be dimensionally and electrically stable over ranges of temperature far exceeding those encountered in transformer operation. All exposed live parts have been eliminated from the upper surface of the body and exceptionally long vertical creepage distances between line terminals and ground have been incorporated. Large terminal knobs, which cannot be cross-threaded on their studs, are provided. Details from Line Material Co., Milwaukee 1, Wis.



Starter

(25) Crouse-Hinds Co., Wolf & Seventh North St., Syracuse, N.Y.

This time delay push-buttom station Condulet, type OFC, restarts motors automatically; can be set to restart within time limits of two, four or six seconds.

Designed for use at Class I, Group D; Class II, groups E, F and G or Class III hazardous locations, the device is similar in outward appearance to standard OFC push-button station Condulets. However, its dome-shaped cover is 9½ in. deep, longer than the standard Condulets.

Interior electrical equipment of the new device includes a push-bottom switch, capacitor, rectifier, sensitive relay and control relay. In addition, a transformer for voltages exceeding 110 is supplied, with capacities of 220, 440 and 550 v. Internal wiring is supplied, including two terminal blocks, one for field connections and another marked for two, four and six seconds. By positioning one wire at any one of these terminals the time delay is determined.

Fixture Has Air Diffuser

(26) Gruber Lighting, 125 S. First St., Brooklyn 11, N. Y.

A fluorescent lighting fixture for large area applications has been designed to accommodate an air conditioning diffuser in its center. Measuring 61 in. square, this unit uses 24 lamps in its inverted-pyramid Alba-glass-shielded body. It is designed for surface mounting, has a 24x24-in. opening through its depth, with the lamps arranged in tiers on the four sides. This opening permits insertion of standard dimension diffusers used for air conditioning ducts, the manufacturer states.

SPANG® CONDUIT

helps assure safe driving on the West Virginia Turnpike

When you're driving along a highway and suddenly enter a long tunnel, it is vitally important to your safety that the tunnel is properly lighted. To assure years of safety through dependable lighting, it is equally vital that the tunnel's wiring receives top protection.

The wiring in the ½-mile Memorial Tunnel on the new West Virginia Turnpike is protected by the best in conduit . . . *top-quality* Spang Conduit.

11,000 ft of 1½" Spang Conduit have gone into the ceiling slab for 426 regular and emergency tunnel lighting outlets. 8,080 ft of 3½" *top-quality* Spang are being used in one tunnel wall for high tension feeders.

Spang Conduit is easier to cut, thread, bend and weld, because the manufacture of Spang is *quality-controlled* throughout. Each length is tested and inspected before shipment.

When you're buying conduit and you want extra quality at no extra cost, be sure to specify Spang. Write for complete information and the name of your nearest Spang Distributor.

Owner:	West Virginia Turnpike Commission
General Contractor:	Bates and Rogers Construction Co., Chicago, Ill.
Electrical Subcontractor:	Barnes and Brass Electric Co., Clarksburg, W. Va.
Designing Engineers:	Singstad & Bailie, New York, N.Y.
Supervisory Engineers:	Howard, Needles, Tammen and Bergendoff, New York, N.Y.
Spang Distributor:	Westinghouse Electric Supply Co., Clarksburg, W. Va.

SPANG® CONDUIT

SPANG-CHALFANT
Division of The National Supply Company
GENERAL SALES OFFICE:
TWO GATEWAY CENTER, PITTSBURGH, PA.
District Offices and Sales Representatives in Principal Cities

marlou halo fixture

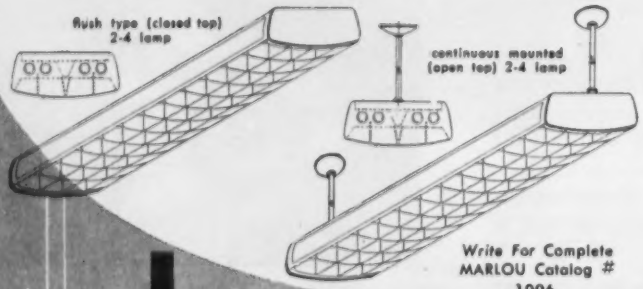
stem mounted (open top)
2-4 lamp, double stem

The MARLOU "Halo" louvred ceiling fixture is recognized by the government, prominent architects and engineers, when stem mounted, as producing the finest overall illumination. It corresponds to Federal #362 to #365 series, and due to its unique engineering design up light almost equals down light. *Result*—the very finest, diffused even light from one of America's best designed fixtures.

Complete installation of the MARLOU "Halo" Fixtures are being made in the Justice Department, Post Offices and many other Government departments.

Specify the "Halo" Fixture for your Job.

"Above All Else...MARLOU is Quality Lighting"



Write For Complete
MARLOU Catalog #
1006.

marlou *A complete line of lighting fixtures for Fluorescent, Slimline and Cold Cathode Lights.*
lights, inc.

General Offices and Factory
FANWOOD, NEW JERSEY

Some select territories open to recognized Manufacturers Agents

Aluminum Alloy

(27) Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.

An aluminum alloy for conducting electricity, No. 2EC, is described as a tailor-made material developed to meet the high performance requirements of the electrical equipment manufacturing industry.

It is said to have superior mechanical properties, with a slight sacrifice in electrical conductivity over other aluminum alloys used for conductor purposes, giving it high yield strength and low creep.

Clamp

(28) Fargo Mfg. Co., Poughkeepsie, N.Y.

A new clamp for attaching Triplex services in mid-span is cast in high-strength, quality-controlled aluminum (plated) and is of one-piece construction. Interlocking fingers encircle all of the outer strands of the messenger as the clamp is tightened. The bail eye with generous radii is located close to the messengers so that there is less twisting of the messenger with oblique angle pulls, the manufacturer states. The clamp may be attached to messengers ranging from 4 ACSR to 4/0 ACSR. Catalog number is MSC-1. Distributed by the Line Material Co., Milwaukee, Wis.

(29) INDICATING CUTOUT — Line Material Co. has added the PIV (porcelain, intermediate duty, vertical dropdown) to its line of box cutouts. It is rated 100 amp, 5.2 kv, with interrupting capacities of 8,000 amp, at 2.5 kv and 5,000 amp at 5.2 kv. Dropdown tube provides visual indication of cutout operation and disconnects the fuse tube from the circuit. Details may be secured from the manufacturer at Milwaukee 1, Wis.

Standard Engineer's Report

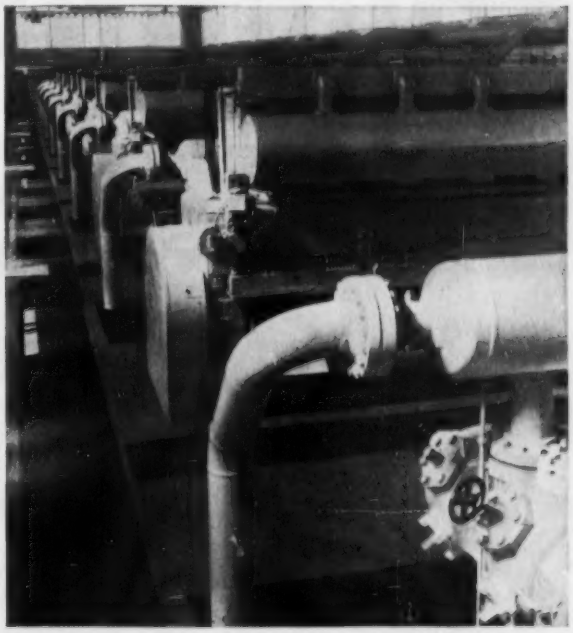
CASE HISTORY

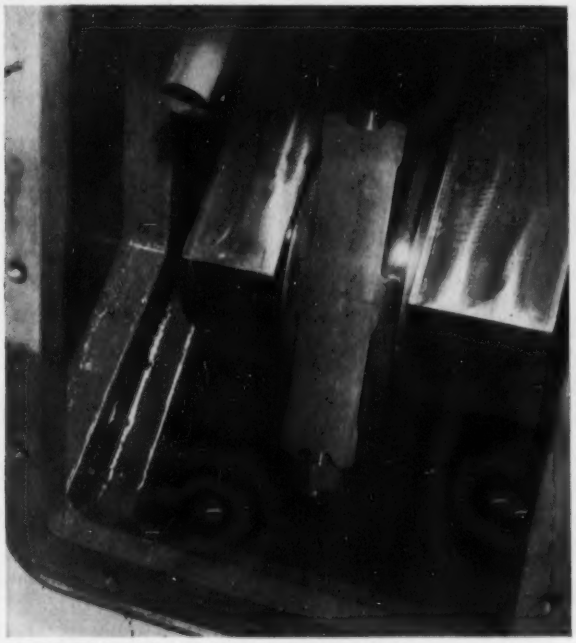
PRODUCT Calol Multi-Service Oils

FIRM Pacific Gas and Electric Company

No compressor deposits in 10,337 hours work!

ORIGINAL CHARGE OF CALOL MULTI-SERVICE OIL still keeps these 8 Clark compressor engines clean and lubricated after 2 years or 10,337 hours operation. There is no appreciable wear on parts, oil shows no deterioration, and neutralization number was only 0.55 at last test. These engines are in P. G. and E.'s Kettleman Hills, California, compressor station on the "Super Inch" gas line.





NOTE PERFECTLY CLEAN CONROD, CRANK and baffle—photographed through inspection hole. All parts are free of lacquer and deposits. Calol Multi-Service Oil in these engines also lubricates compressor cylinders, journals, and crankpins.

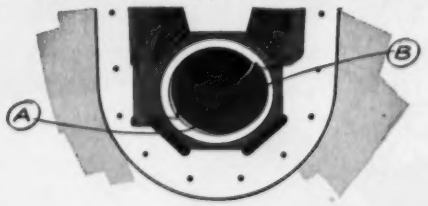
FREE CATALOG: "How to Save Money on Equipment Operation" will be sent on request to Standard Oil Company of California, 225 Bush Street, San Francisco.

FOR EXPERT HELP on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative, or write to 225 Bush Street, San Francisco, California.

CALOL

TRADEMARK "CALOL" REG. U. S. PAT. OFF.

How CALOL Multi-Service Oil cuts costs in all types of compressors



In crankcase and on cylinders, Calol Multi-Service Oil reduces wear and oil consumption—has cut consumption 20% in air compressors.

A. Oxidation-resistant compounds prevent formation of varnish. Detergent keeps contaminants suspended in oil, prevents foam.

B. Special compound assures "hot-spot" lubrication...covers surfaces rapidly. Calol Multi-Service Oils also recommended for pumps, diesel engines, enclosed gears.

STANDARD OIL COMPANY OF CALIFORNIA

NOW AVAILABLE

FROM NATION-WIDE WAREHOUSE STOCKS*

BIG CABLES

WITH THE SUPERB

TOUGHNESS

AND

FLEXIBILITY

FOUND ONLY IN

BRONCO

Certified 60

Bronco 60 Certified Type W cables are made in all sizes from 8/2 to 1/4. They have a tough Neoprene jacket certified by a registered professional engineer to contain not less than 65.46% Neoprene. Made with coarse or fine stranding, Certified Type W possesses incomparable flexibility. The proof is in the product. Try Bronco 60 Certified Type W—you'll standardize with Certified.

Sold nationally only through Electrical Wholesale Distributors and manufactured by

WESTERN INSULATED WIRE CO.
Los Angeles 58, California

* *Warehouse Stocks Maintained in the Following Cities:* ATLANTA, GEORGIA • BALTIMORE, MARYLAND • BOSTON, MASSACHUSETTS • BUFFALO, NEW YORK • CHICAGO, ILLINOIS • DETROIT, MICHIGAN • KANSAS CITY, MISSOURI • LOS ANGELES, CALIFORNIA • LOUISVILLE, KENTUCKY • MINNEAPOLIS, MINNESOTA • NEW YORK, N. Y. • PHILADELPHIA, PENN. • SAN FRANCISCO, CALIFORNIA • SEATTLE, WASHINGTON

Signal Arresters

(30) Line Material Co., Milwaukee 1, Wis.

Type L signal arresters have been rerated for application on d-c circuits of 0-125 v and on a-c circuits of 0-175 v, the manufacturer states. This new rating represents an increase in possible d-c applications; a-c applications remain the same. Designed primarily for protecting railway signal systems, the type L also will provide lightning protection to other low-voltage circuits such as fire alarm, remote metering, airport lighting and relay circuits.

On-Off Control

(31) Tork Clock Co., Mount Vernon, N. Y.

This addition to the manufacturer's line has a seven-day dial; permits programming of operations without manual resetting. The dial is sectioned and marked for each day of the week, with each section slotted to accept programming tabs.

Divided and marked into two-hour periods, at even hours, the dial has a total of 84 slots. The switch is installed into the line controlling the electric device and, unless altered, is always in the off position.

Tabs are inserted into the slots for the hours that on operation is required. As the slow-moving dial rotates, the tabs reaching the on contact close the circuit. When the last tab passes the switch, pressure is removed from the contact and the clock returns to the normal off.

(32) MOBILE RADIO—The Lister circuit has been incorporated in the Fleetway, two-way radio manufactured by the Connecticut Telephone & Electric Corp., Meriden, Conn., for operation in the 450-460 and citizens' band. This model offers FM transmission and reception; is said to give noise-free speech and good coverage in congested areas.

THE FISHER-PIERCE
SERIES 64400 PHOTOELECTRIC CONTROL

This control embodies the proven, dependable F-P basic circuit, in a simple, compact form. Mounting versatility of this unitized control is represented in the adaptions to various manufacturers' luminaires illustrated here, as well as ballast, pole top, cross arm, standard and other mountings.

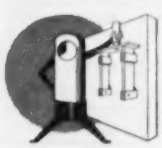
Versatility of the Series 64400 Control is equalled by its economy. Low initial cost, savings in wiring, labor and materials, as well as low maintenance cost, make it economically practical to use one F-P 64400 Control per lamp.

Complete Descriptive Data on Request

THE FISHER-PIERCE CO.
43 Pearl Street, So. Braintree, Boston 85, Mass.

EXPORT: PHILLIPS EXPORT CORP.
DIVISION OF NORTH AMERICAN PHILLIPS
100 E. 42ND STREET
NEW YORK 17, N. Y.

IN CANADA:
NORTHERN ELECTRIC
CO., Ltd.



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Special New Kitchen Package for contractors. Install this unit in your own home. Merchandise and sell it to your customers. CUTS HOURS OFF ELECTRICAL OUTLET INSTALLATION TIME. *(Free fitting for contractors with one purchase of Plugmold.)*

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Plugmold opens the door to a big new market — $15,000,000,000. In electrical modernization needed in 30 million buildings. Sell Plugmold and pull in rewiring business and related sales.

PROFIT plus prizes when you PLUG PLUGMOLD

Contractors and jobbers profit on Plugmold sales and extra business . . . and get valuable prizes, too! Everyone wins every sale of Plugmold earns prize points.

***Plug* PLUGMOLD and win 3 ways!**

See your electrical jobber for details.

THE WIREMOLD COMPANY
HARTFORD 10, CONN.

BULLETINS ETC.

(33) RUBBER-INSULATED CABLES—The complete story on Okolite-Okoprene 0 to 5,000-v unshielded, rubber-insulated, neoprene-sheathed cable is told in bulletin OK-1085 released recently by The Okonite Co., Passaic, N.J. Included are current carrying capacity tables, short-circuit curves, voltage regulation formulas and methods for determining conduit sizes, pulling tension and bending radii. There is also a discussion on advantages of cables that do not require shielding for 4,160-v operation. The bulletin has four main sections: construction features; engineering information, installation and handling techniques; splicing and terminating procedures.

(34) ALUMINUM PRODUCTS — A 24-page booklet on mill products and services has been prepared by Kaiser Aluminum & Chemical Sales Inc. It gives data on aluminum alloys, forms, properties, applications and availability. Condensed tables and charts are included. It may be obtained from the Industrial Service Division, 1924 Broadway, Oakland 12, Calif.

(35) FUSE LINKS — A three-color, 16-page catalog is available from James R. Kearney Corp., 4236 Clayton Ave., St. Louis 10, Mo. Illustrations show construction of all the manufacturer's fuse links for primary and secondary distribution cutouts. Included are speed ratios and safe coordination curves.

(36) SOLDERSEALED POTHEADS — Anaconda Wire & Cable Co. has issued an addition to Section 13 of its general catalog under the title Soldersealed Potheads and indexed as 1330. It is also available in a separate catalog as publication 6-79-30. The sealing process is described; photos and drawings show construction of potheads; field installation is covered briefly. Tables list dimensions and data for all sizes, for compound-, oil- and gas-filled pothead installations, 15,000 to 46,000 v.

(37) SWITCHES—Bulletins on its type HR automatic, high-speed short circuiting switch, 34.5-161 kv, and its transmission and distribution substations are offered by Southern States Equipment Corp., Hampton, Ga. The former is designated 54 HR, the latter, 54 SU.

(38) ISOLATED-PHASE BUS—A 20-page booklet describing features and applications of isolated-phase bus has been issued by Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa., as B-5906. A complete line of equipment for service from 15 to 69 kv is described and typical installations are shown. Drawings and photos show design and construction details. Ratings and dimensions are included.

(39) TRANSFORMERS — Construction features and mechanical data on its subway distribution transformers are given in bulletin 61B-6333A by Allis-Chalmers, 939 S. 70th St., Milwaukee, Wis. This line incorporates Curvacore design, said to reduce weight 25 to 30%. Transformers come in ratings of 15 to 167 kva, single phase and 15 to 150 kva, three phase, 15,000 v and below.

(40) MAINTENANCE—A new edition of "Good Operating Practices" has been issued by Johns-Manville, 22 E. 40th St., New York 16, N. Y. This 12-page brochure contains 101 suggestions for maintaining plant buildings and equipment; contains recommendations for getting the best service out of insulations, packings, refractory products, roofing and friction materials.

KILL TWO BIRDS WITH ONE STONE—Fill out this coupon and get back valuable information from as many sources as you indicate.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after February 1

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A QUALITY LINE • A FAST SELLING LINE

DUTCH BRAND
PLASTIC TAPE

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ELECTRA'S HUSBAND

SIX of us were gathered around the luncheon table on the last noon of a three-day industry conference. The meeting had been a shirt-sleeves affair —filled with all sorts of refreshing ideas and new approaches to troublesome problems.

"Will one of you wise men give me some advice?" a youngish department supervisor for one of the bigger companies asked. "Tell me how I can put to work some of the wonderful suggestions I've picked up around here during the last couple of days. I could save our outfit a lot of money when I get home with just two or three new procedures I've heard about."

"Well you might go into the top boss' office and tell him about them," I suggested. "If he thinks sufficiently well of them he could order them put into effect."

"Wait a minute," one of the older and sager heads at the table interrupted. Because he occupied a position in the top hierarchy of his own organization all of us listened intently. "That won't work. Chances are the boss will say 'no' because they were not his ideas. But even if he does order something done, very little if anything will happen. There are too many guys with bitching power in our kind of organization. They can't say 'yes' to anything but they surely say 'no' whenever the opportunity offers. And even if they don't openly oppose something new such as you suggest, they know all the tricks in setting up obstacles. In a few weeks you'll wish you never had thought of proposing a change."

"You're just a damned cynic," one of our companions opined. "I've got an idea that will work. Bill can wait until he is head of his department and then he can do the things himself without consulting any superior authority."

"That's what you think," the older counselor commented. "He'll wait around until his immediate superior retires and by that time Bill will be so old and set in his ways that he won't want to make any drastic changes either."

The laughter that this brought forth was not forced. Everyone at the table had seen this happen in his own company.

"Since you seem to have all of the answers, why don't you give Bill a prescription that will work," I taunted. "Or is there any answer?"

"Sure," the wise executive answered. "In fact it's easy. If Bill has picked up some ideas which he knows are right and which he is certain will save money or manpower, he should recommend to his management that they employ an outside firm of experts to make a study of the problem and furnish a report and recommendations. In nine cases out of ten they will do just that.

Want to Put Across An Idea— Hire an Expert

"In due course a group of these experts will come into the company and make a careful survey. They will interview everybody including Bill. Then they will prepare a big, thick report all fancied up with charts and graphs and economic studies. The report will urge that the company do the very things that Bill wanted to accomplish in the first place. But coming from so-called outside 'experts' the recommendations will carry weight. So the company will pay the consultants a big fat fee and the procedures will be adopted as company policy.

"It's just as simple as that," he concluded. "Now let's go back to the meeting."

That evening I was telling Electra about the lunchtime conversation because she knows most of the people involved. As might be expected, her sources of current intelligence are much better than mine.

"Well, he knew what he was talking about," was her comment. "I had lunch with his wife and she told me that he had hired Somebody, Somebody, Somebody and Somebody to do a study of his own company's operations. They brought in the report a couple of weeks ago. Furthermore the suggestions and recommendations were so appropriate that the company has hired the consulting firm on a permanent basis."

WHY will the same fellow who will unfailingly buy a Ford or General Motors car, and big-name brands of everything from shoes to peanut butter, turn the next minute and "cuss out" big business? Prof. J. D. Glover of the Harvard School of Business Administration has written a fascinating and useful book* that answers this knotty question. I've been telling Electra (who sometimes strikes out at Big Business herself) about some of Prof. Glover's findings. Never before in the scope of a single volume has the full range of business criticism been so carefully laid out and displayed, so neatly classified and so sagaciously and entertainingly discussed.

While Prof. Glover finds most of the criticism too self-contradictory and too implausible to be worth rebuttal, he submits that some of it, if properly understood, may be valid and even helpful. He deals with three major areas of criticism: (1) the economic criticism that big business is inefficient and monopolistic; (2) the political and social criticism that big business is authoritarian, dangerous for democratic institutions, and suppressive of individual freedom, responsibility and self-expression; and (3) the religious, ethical or moral criticism that our whole business civilization is unduly acquisitive, materialistic, individualistic, unfriendly and ugly.

He offers this advice to business: Don't act like the caricature of yourself that your critics draw. Help destroy the outworn legal fiction that corporations are soulless entities dedicated exclusively to making a fast profit. Open yourselves up to more serious study so that the public gets better informed about the realities of business. Business, he says, is no better or worse than the rest of society in which it finds its home. It will get better as society improves. And there is no lack of voluntary groups in our society striving for amelioration on every level.

The businessman who reads the book can learn about measures business can take to reduce the unmerited hostility from which it now suffers.

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*"The Attack on Big Business" by Professor J. D. Glover, Division of Research, Harvard Business School. $4.

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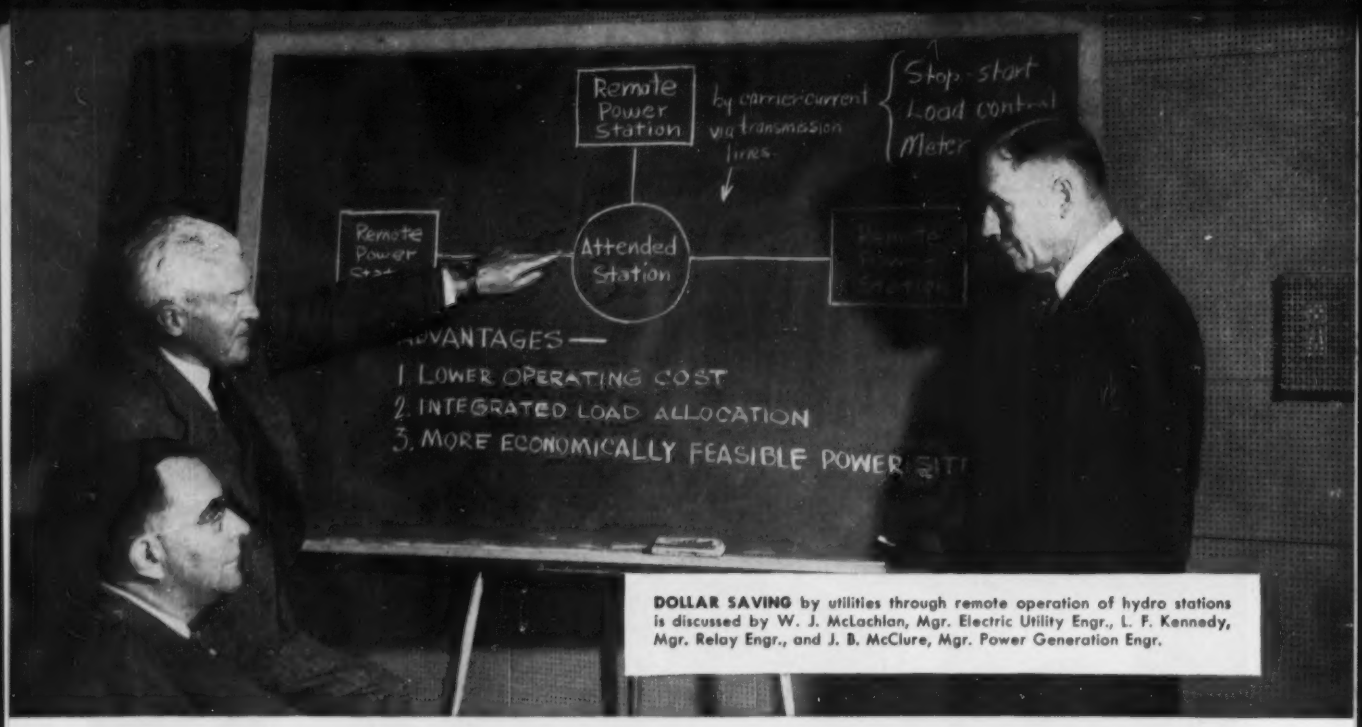

DOLLAR SAVING by utilities through remote operation of hydro stations is discussed by W. J. McLachlan, Mgr. Electric Utility Engr., L. F. Kennedy, Mgr. Relay Engr., and J. B. McClure, Mgr. Power Generation Engr.

Increasing fuel, labor costs...

Spur trend to automatic hydrostations

Rising costs of labor and fuel, dependability of control equipment, and high operating flexibility are giving new impetus to the trend to automatic hydro-electric power plants.

NEW SITES, CONVERSION ON UP SWING

The move is evident in the growing number of new plants now being equipped with automatic control. And the trend shows clearly in the conversion of existing manually operated plants on the one hand and in the development of marginal hydro-sites for automatic operation on the other. Many marginal sites which manual control costs would render uneconomic become feasible through automatic control.

OPERATING ECONOMIES MARKED

At Stewarts Bridge, N. Y., for example, General Electric engineers helped meet equipment specifications for the world's largest single-unit, fully automatic station. Here, Niagara Mohawk Power Corp. is finding that after higher installed costs, the expense of maintaining the 37,500 kva station is practically nil. Capitalizing on Type 20 Carrier Current control, which permits signal transmission right on the power line, the station can be brought on the line, controlled, metered and shut off from a central point six miles away.

When reviewing system operating costs, utilities can profit from consideration of automatic, remotely controlled hydro-electric stations. High accuracy equipment now available makes them more attractive than ever. For full data on how automatic hydro-electric plants can help reduce over-all system operating costs, write to General Electric Company, Section 301-276, Schenectady 5, New York.

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HIGH OPERATING FLEXIBILITY reaches peak since hydro-electric plant can be brought on the line automatically in a matter of minutes to meet daily load changes.

DECEMBER 1954 Vol. 113, No. 6

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

Will You Become the Missing Link?

Asks A. H. Gudie*

President
Biddle Trade Bureau
Los Angeles

In the chain of distribution is the distributor in danger of becoming a job lot dealer or broker instead of true representative of the manufacturer? Who's to blame? What can be done about such a trend?

During recent years we have witnessed a trend that, if allowed to continue, will result in the wholesale distributor of apparatus and supplies degenerating into a job lot dealer and broker. There are some who say it has already happened. It is true that we already have electrical wholesalers who purchase from any manufacturer that offers them the best price at the moment. There is no thought of "representing" the manufacturer or of handling a certain line. It is simply a matter of turning over a volume of goods or merchandise. The fact that it is electrical merchandise is almost incidental. It might just as well be ash trays.

This trend is only partially due to the conduct of the wholesale distributors. Manufacturers are equally responsible. Also the manufacturers' "agents." It takes two to make a transaction so if there are wholesalers who buy in that manner then there must also be manufacturers who sell the same way.

Once upon a time, a manufacturer who wanted national distribution appointed "agents" or representatives in a few major centers and allocated to each a sizable territory. At first this was to give the distributor more "service" but, when the manufacturer's agent began to call upon the distributor's customers and exploit the manufacturer's brand or products, it was the beginning of the end of this function so far as the distributor is concerned. Soon the distributor came to depend upon the agent for all such exploitation and promotion.

As our population and volume grew, the number of distributors multiplied and the agents' commissions did likewise. Then frequently one of two things happened. The agents' territory was cut down or the manufacturer stepped in with his own "district" office. In many cases the agent who formerly represented the line on a commission basis became the new district manager.

A. H. "Bill" Gudie

Some agents have complained bitterly that as soon as they built up a line to a point where there was some gravy in their commissions, the manufacturer stepped in with his own office and frequently with his own warehouse stock. Perhaps this has been true in some cases. But it is also true that many times it was the agent who by bad practices showed the way to the manufacturer.

An historian would probably find that the first "warehouse stock" was established by an agent, not directly by a manufacturer. Also, there have been instances of the manufacturer's agent buying his stock and selling direct to the wholesaler's customer. Usually this was at a price higher than the agent was supposed to sell to the distributor but lower than the wholesaler's resale price. In this manner the agent got his regular commission plus a part of the wholesaler's margin. Nice business!—while it lasted.

Meanwhile, as the number of manufacturer's agents or district offices and salesmen increased, the distributor has done less and less promotion of any one line or product. The manufacturer has blamed the distributor and said he can not be depended upon to exploit or promote a brand or item. Perhaps so.

Less Rep., More Customer

With the establishment of the manufacturer's agent or the manufacturer's own sales office the role of the distributor changed. He no longer was the only representative of that manufacturer in an area. In fact he became less a representative and more of a customer. He was no longer the liaison between the producer and his customers, the consumers. When the manufacturer appointed other distributors in the same area there became still less incentive for the individual distributor to "represent" the manufacturer and

* Condensed from address to the Pacific Zone Convention of National Association of Electrical Distributors in San Francisco, Oct. 6, 1954.

he became, more and more, just plain customer.

Certainly the distributor can do little, if any, exploitation for a manufacturer today. If he were to try he would be competing with the manufacturer's own salesmen or perhaps he would build up a demand for goods that would be sold on a cut-price basis by the other "distributors" handling the same line.

Perhaps the manufacturer is doing a better job of it than the distributor would be doing if it had been left up to him. Modern-day products are so complex that it is probable that their exploitation does require a specialist such as the factory-trained representative.

This may be another reason why so many manufacturers are establishing their own sales offices to replace the so-called manufacturer's agent. Some of these "agents" represented so many manufacturers that they spent little, if any, time exploiting or promoting any one manufacturer's line so they failed in that field just the same as the distributor did.

Regardless of who or what is to blame, I think we must accept the fact that the major function of introducing, promoting or exploiting a line or product has by now been lost to the electrical wholesaler. We must expect that the manufacturer will have his own sales representative in the field to build up customer acceptance and demand for his product.

The name "distributor" implies a relationship between the manufacturer and wholesaler that is more than buyer and seller. A distributor should be an integral part of the manufacturer's selling organization. He should not be just a customer who happens to place frequent orders. But when the distributor ceases to exploit and promote a certain line the job that he does for the manufacturer becomes a different one. The relationship between them changes considerably. Certainly, a manufacturer looking over a list of potential distributors will now appraise them differently; probably less critically. He will be less concerned with the front the distributor maintains and more interested in how easy it is for his consumers to buy from the distributor.

Tops in One, A Dog in Another

To this end, some manufacturers have deliberately chosen price-cutting volume operators even though this is quite obviously short sighted. The distributor may no longer play a major part in introducing or exploiting the manufacturer's brands or products but it is still true that "By the company ye keep, shall ye be known." The reputation of the distributor has a great deal to do with the acceptance of the line in any given area. Proof of this is readily evident to anyone traveling across the country. In one community line A will be considered tops and line X a dog, whereas in another area just the reverse will be true. It all depends upon the type of distribution they have in each place.

"A great many of the troubles of your contractor customers come from the fact that you make it too easy for them . . . You can kill with kindness . . ."

It is becoming quite a common thing for the manufacturer's representative to call upon a contractor or industrial customer of the wholesaler and to quote him prices. Most manufacturers publish price sheets in a manner that is designed to facilitate such quoting as it is considered essential in making an effective promotional approach. If the manufacturer's representative confined his quoting to the prices that are thus published by his company there would be little criticism, but he does not stop there.

The representative is not satisfied to make a promotional pitch. He tries to get an order—in the face of the avowed policy of not selling direct. The manufacturer's salesmen frequently act as though the distributor can not be relied upon to get the order for them even after they have done the promotional work.

Too frequently the manufacturer's representative quotes prices below those published by his factory and, after he gets the customer's promise to buy at a stipulated price, he then peddles the order around town until he finds some wholesaler to fill it for him at the small margin that is left.

If this practice were confined to the manufacturers who sell to every Tom, Dick and Harry who purchases on a jobbing basis, we would assume that it is just what must be expected. But when it is done by the representatives of manufacturers having wholesale distributors who follow some degree of ethics and good business conduct, then it is most degrading. Such manufacturers are undermining their own distribution structure and may soon find that they too are selling only to job-lot buyers. There won't be anyone else left. The distributor as we know him will have become the missing link.

The wholesaler who participates in such a transaction is surely cutting his own throat. Combine the effects of such selling with the increased warehousing and direct shipping being done by the manufacturers and what is left for the wholesaler?

There is nothing in the relationship that exists between the manufacturer and his distributors, wholesalers or jobbers that justifies the manufacturer negotiating on a price basis with the distributor's customer. If the manufacturer wants to cut the price 10%, then he should cut the distributor's cost likewise; unless he does that, he is playing with the distributor's money. Since it is his money that is being given away, it seems to me that the distributor should have something to say about it. Of course, he can refuse the order but that does not square the situation. Perhaps the distributor might have obtained the same order at a higher price and thus made a fair gross margin. Perhaps the distributor happens to have a better salesman or a better contact.

One thing is certain. After the manufacturer has quoted a cut-price direct to the distributor's customer, there is absolutely no chance for the distributor to get a better price. The distributor has enough trouble trying to hold his own salesmen in line without having to cope with the price-cutting tactics of a manufacturer's salesman who is calling upon his customers. I think that too frequently the manufacturer's salesman forgets that it is not his customer whom he is quoting.

There are many reasons why it should be an inviolable rule that under no circumstances should the manufacturer negotiate on a cut-price basis with the distributor's customer unless the distributor is present and active in the deal.

Who Warehouses and Ships?

Probably the wholesale distributor's function next seriously affected by the changing times is the matter of warehousing and stocking. Ever since I have been associated with the electrical business, I have heard discussions relative to the advantages or disadvantages of manufacturers' local warehouse stocks.

There can be little doubt that the existence of manufacturers' local stocks exerts a greater influence upon your methods of doing business than any other single factor. The question—is it a good influence?

The answer probably depends upon where you sit. If you are a small underfinanced distributor, you undoubtedly find such stocks a distinct advantage. They enable you to compete on an

equal basis with your larger competitor who is capable of carrying his own stock. If you are a manufacturer new to the field and unable to get as a distributor anyone but a small underfinanced distributor, a local stock lets you help your distributor compete more equally with the more favorably situated distributor of your competing manufacturer.

Conversely, both of those situations translate into detrimental factors to the well-established distributor.

The wholesale distributor performs many important functions, but maintaining a stock of goods is the most important. In fact, nearly all of the other functions revolve around that one, and so anything that threatens the distributor's function of carrying a stock is a threat to his existence. Wholesalers who encourage and pursue practices that minimize the stock-carrying function are committing commercial suicide by slow poison. The growing tendency to transactions that short circuit the stocking of merchandise is also at the root of many of the industry's present price-cutting problems.

Eventually the manufacturers must come to a realization that they are performing the distributors' function and that they are not getting paid for it. By that time they will have increased the size of their warehouses and personnel and since they are human, there will be a natural resistance to cutting back. Meanwhile the distributors warehouse facilities will have atrophied to a point that they could not get back in the groove and handle the business if it did return to them. I don't know what is going to happen but I do know that the situation as indicated by this trend will not continue indefinitely.

Furthermore what is right about it? It certainly isn't moving goods into the consumers hands any more cheaply. If anything the total cost is higher, because at present the manufacturer is to a large degree duplicating the wholesaler's shipping facilities.

Pay for Service Performed

The solution? Simply this. Recognize the principles upon which compensation exists and pay according to the functions performed. All that is necessary to correct this situation, to put the wholesaler in the distributor business and to get the manufacturer out of it, is to change the distributor's discount so that it is not the same for both shipments direct to customers and to the distributor's warehouse stock.

If it is worth 15% to the manufacturer to have the wholesaler service an order that the manufacturer ships direct, it is worth more when the wholesaler warehouses and ships himself. Accordingly, when the manufacturer ships to the distributor's warehouse, the goods should carry a bigger discount than when the manufacturer ships direct to the distributor's customer.

To put it differently. If the wholesaler ships out of his stock and pays the freight to a customer a hundred miles or so out into the country, instead of asking the manufacturer to pay that freight by making a direct shipment, he certainly is performing a greater service for the manufacturer and should be compensated accordingly.

The present distributor's discount has probably been established by the manufacturer on the premise that it is the amount of compensation he should pay the distributor, who is maintaining a stock in his warehouse, for selling, shipping and servicing sales of various quantities to contractors, dealers and industrial consumers. It is not for me to say if the presently established discount is right but, if it is, then it is obvious that the distributor who only sells and services an order without warehousing or shipping it, should receive a lesser discount.

In effect, that is happening at present but it is brought about through the price cutting that usually takes place on a direct-shipment order. If the manufacturer is interested in seeing more orderly marketing of his product, he should not leave such adjustments to the happenstance of competition. He should establish a discount schedule that pays less to the distributor who does less. This will at the same time compensate the manufacturer for the additional expense he incurs when he warehouses and ships.

It is my contention that, when such situations are brought into proper balance, the industry (and society) will benefit from the most efficient distribution system because the function will be performed by those most capable of doing it. If the distributor can best handle the warehousing and shipping of small orders for the percentage differential provided, it will be the distributor who will do it. On the other hand if the manufacturer can best do it, it is inevitable that eventually the distributor will become a sales agency and the manufacturer will be the warehouser and the shipper.

Too Much Free Service?

And now, what about the other end of the link—the selling side? Most of your troubles on this end of your link in the chain can be summarized under the statement "you attempt to give too much for what you receive."

It would indeed be strange if I were to say that you give too much service and I do not intend to do so. But you do frequently give more service than you get paid for.

Your customers are the most cultivated, cherished, pampered and spoiled group of customers in the world. Whatever may be wrong with your industry, you are not guilty of failing to give your customers service.

You have figured their jobs for them, endorsed their notes at the bank and bought them coffee. You have almost given them your merchandise. But you can kill with kindness just as surely as you can with poison. A great many of the troubles of your contractor customers come from the fact that you make it too easy for them.

Quite often you hear from contractors something to the effect that you, a distributor, should not sell to everyone. Obviously they mean you should not sell their customers just the same as you, a distributor, think that the manufacturer should not sell your customers.

Do As You Would Be Done By

Naturally we all want each link to stay in its place in the chain. But if Mr. Contractor does not want you to sell everyone for fear you might sell his customer, how are you going to discriminate? Obviously this calls for some kind of conduct on the part of the contractor that will enable you to discern whom you should sell.

It is just as necessary for the contractor to act like a wholesale buyer as it is necessary for the distributor to act and perform like a distributor. It should be necessary for the contractor to qualify for the wholesale prices and services the distributor will furnish him.

However, if the contractor does not do something that gives the distributor an advantage in doing business with him, why shouldn't the distributor sell anyone?

The electrical contractors have the same problem that the distributors have. The details may differ—slightly—but the fundamentals are the same.

I have pointed out a number of practices and trends in connection with the manufacturer-distributor relationship. Many of these are transmitted to the contracting branch of the industry. It is important that the contractors also analyze the performance of their link in the chain. It is just as vital that they act as, and be, good profitable customers of the wholesaler as it is necessary for the distributor to be a good representative of the manufacturer.

If not, some economic force is quite likely to use a hacksaw and cut out a couple ineffectual links that will then become missing links forever.

Employee Interest Is Stimulated When

Saving Is Basis of Suggestion Awards*

Having recently gone through the mechanics of establishing an employees suggestion plan, it is thought that the type of plan and its operation may be of interest to other utilities. An important feature of the plan of the Los Angeles Department of Water & Power is the basing of awards on estimated savings through adoption of the suggestion. The plan has been in operation now for 23 months and management feels well satisfied with results as compared with the cost of administration. Employees have responded favorably to the plan and the utility feels well compensated for the expense, time and trouble of operating an employee suggestion plan, even though financial saving is not the criterion by which this or any other suggestion plan should be judged.

In the 23 months the plan has been in operation, to and including October 1954, a total of 1,163 suggestions have been submitted. Of these 64, or 12%, have been adopted. The fact that so small a percentage of the total suggestions submitted were of little or no value in this initial or trial stage is most encouraging. The percentage might have been expected to run much higher. This indicates that the employees took the plan seriously from the start.

Estimated saving resulting from adoption of the meritorious suggestions is $33,362. This monetary saving is entirely aside from the many collateral advantages of any suggestion plan, such as improved employee morale, safer practices and better service to the public.

Score Sheet for Suggestion Plan

23 Months' Operation

Suggestions received	1,163
Suggestions processed	528
Suggestions being investigated	635
Suggestions adopted	64
(12.0% of total processed)	
Suggestion awards paid	30
(5.8% of total processed)	
Suggestion commendations issued	34
(6.4% of total processed)	
Suggestions not adopted	464
Of no value	289
Invalid	113
Identical	50
Withdrawn	12
Amount of awards	$ 2,315.00
Average amount of award	77.16
Estimated savings	33,362.51

Direct cost, in addition to awards, for total period, not available in detail at this time. Direct cost for 19-month period to July 1, 1954, was $13,572, as compared with estimated savings of $30,061.

First Step Taken

Having decided to adopt a suggestion plan, the first step logically was to review the literature on suggestion plans and to study in detail the features of some of the most successful of these plans. "Getting Results from Suggestion Plans" by Herman W. Seinworth (McGraw-Hill Book Co., 1948) contained experience and advice that proved applicable to the problem at this stage.

Members of top management met with the committee chairman on several occasions and suggested changes were incorporated into the original proposal by means of cross-out and addition in a different colored ditto so that both the original and the suggested change were on record. This method proved very helpful many times when the same or similar suggestions were proposed later. After three drafts, using the same system, a final employee suggestion plan, specially tailored for the department, was agreed upon.

The next step, in the opinion of the author, greatly influenced the overwhelming and immediate acceptance of the plan. This wise and human relations step was to send copies of the proposed plans to the supervisors of the so-called "middle management" group and representatives of the employee organization, soliciting their comments. The result was that there was no unfavorable reaction to the plan as a whole as practically all supervisors and a very large percentage of the employees knew that a plan was being developed—and more than that, they had an opportunity to review it before it was placed into effect.

The next move was to place the plan into effect. To accomplish this, a management staff member was assigned the task of preparing enabling legislation. On Feb. 26, 1953, the Board of Water & Power Commissioners by board resolution No. 676 established the Employees Suggestion Plan, setting forth the purpose, eligibility and a schedule of step awards for tangible net first year's savings and providing that standards and procedures for effectuating the employees suggestion plan be established by the general manager.

On April 1 the general manager issued a bulletin providing for a secretary-director and a suggestion plan committee composed of seven members on staggering terms of three years. The secretary-director reports to the chief administrative office of the department and acts as secretary to the employees suggestion plan committee. He is in charge of the office staff and directs the operations in accordance with rules for the uniform administration of the plan.

In setting the plan in motion, the committee was somewhat handicapped as it was unable, in the wealth of information that had been accumulated, to find a set of existing rules governing the administration of suggestion systems that could be used as a pattern. Although rules in skeleton form were plentiful for plans in private industry, few were available for public agencies. Some assistance was gained from existing rules for the State of California, U. S. Department of the Interior and the Department of the Navy; however, none of these plans seemed to quite fit a utility. Probably more guidance was received from

*Based upon a presentation made by Clayton M. Allen, engineer in charge of general plant division of the Los Angeles Department of Water & Power, before the National Association of School Business Officials, Los Angeles, Oct. 12, 1954.

the plans of the Detroit Edison Co. and the Philadelphia Electric Co. than from any other single plan in operation. After some two months of committee study, a set of seemingly workable rules and procedures was ready and transmitted to management early in July. They were approved with only a few minor changes.

The next order of business was to develop a suggestion blank. After analyzing well over 50 suggestion blanks in use throughout the country, and being aware of the department's family-type, career-service esprit de corps, a rather plain and simple single sheet form was decided upon, without frills but set up and printed in two colors on two sides that can be conveniently folded. This form was originally distributed through pay-roll channels and is now stocked and available in department stationery store, department library, employees association office and the employee suggestion plan office. Also, each employee receives a form with the acknowledgment letter from the secretary-director as the result of a suggestion sent in.

Next in order was the design of the award and commendation certificates for presentation to the employee, along with his monetary award, or to the employee whose suggestion is recognized as worth-while but does not qualify because a net monetary saving cannot be calculated. The certificates are 6x9 in. in size and are printed in two colors on parchment-type paper with the employee's name artistically inked in by hand and framed.

Support of the plan by supervisors and instructing them in methods of analyzing suggestions and computing net savings is being accomplished by incorporating appropriate data in two existing training programs "Essentials of Effective Supervision" and "Human Relations in Supervision" conducted by the department's training section. Each of these courses devotes about a half hour to the suggestion plan and, occasionally, the secretary-director of the plan or the chairman of the employees' suggestion plan committee personally appears to give brief presentations and answer questions. The training section also conducts an orientation program consisting of a one-day course for all new employees of the department. In this course, about 15 minutes are devoted to explaining the opportunities and operations of the suggestion plan. Further publicity of the plan is accomplished by articles appearing in the house organ *Intake,* which is published monthly by the department's public relations division.

As to the success of the plan and its results. It is felt that the plan has made a highly successful start, as indicated in the accompanying table.

Over the 23 months since establishment of the plan, the full time of the secretary-director has been supplemented by an average of 1½ persons to assist in the operation of the employees suggestion plan office, principally in the receiving, logging, routing for processing, reporting and secretarial work for the committee. The investigation and analysis is carried on by the line and staff organization.

Because of the accumulation of suggestions from the time the plan was announced until the rules and procedures were established and suggestion blanks prepared and distributed, the processing started in with a considerable backlog as is indicated in the fiscal year report. The office force was increased to a total of three with two clerical employees assisting the secretary-director and the backlog considerably reduced. Suggestions are now sent on their way for investigation and analysis within four weeks after receipt and the average time of completion, from receipt to award or commendation, averages eight weeks.

One of the provisions set up in the rules and procedures, and very wisely, is that just prior to the end of the fiscal year the employees suggestion plan committee shall present its comments and recommendations respecting the operation of the plan. Accordingly, the first committee, when nearing the end of its first year's operation, submitted comments and recommendations based upon experiences gained in the analysis of approximately 600 suggestions submitted and a brief review of an additional 300 suggestions.

DEPARTMENT OF WATER & POWER
CITY OF LOS ANGELES

Certificate of Award

Department Employees

as official recognition and appreciation for a valuable suggestion which has been adopted and which is an outstanding contribution to the improvement of Department operations

Award $1000.00

Date April 27, 1954

General Manager & Chief Engineer

DEPARTMENT OF WATER & POWER
CITY OF LOS ANGELES

Certificate of Commendation

Department Employees

as official recognition and appreciation for a valuable suggestion which has been adopted and which is an outstanding contribution to the improvement of Department operations

General Manager & Chief Engineer

Certificate of award and commendations are part of plan

The committee recommendations are under study by management who, again in the best of human relations procedure, has invited division heads to discuss them with supervision and submit their comments. There are indications of general agreement with the recommendations of the committee and the secretary-director and that management may soon approve some or all of the changes.

The plan has grown rapidly and it is believed remarkably, considering that there has been practically no promotion work in its behalf. Now that the secretary-director is practically caught up on the processing and has reduced the backlog resulting from the spontaneous inflow of suggestions, it is felt that it would be appropriate to initiate meetings of supervisors and employees as well as promotional and publicity material to enable a better understanding of the plan and encourage closer coordination between employees and supervisors which will, it is believed, produce more and better suggestions.

The acceptance of the plan and its progress under the conditions described, although far from perfect, has been largely possible because of the assistance received from the many organizations and their executives who answered questions and sent information on their respective plans. The Los Angeles Department of Water & Power wishes to take this opportunity to sincerely thank them, including those already mentioned, as well as the National Association of Suggestion Systems and the Suggestion Plans Association of Southern California of which the department is a member.

Why the Preference Clause Is Indefensible

To be told that you are on your own for future power supply after your purchase of government power over a period of 30 years had assured financial success of Bureau of Reclamation projects—that's a tough break and an example of the inequity of the preference clause. To have relied solely upon the bureau for power supply, at the government's own request, by contract provision, for all those years, makes exercise of the preference clause all the more unjustifiable in this case.

When you are the marketer of 80% of bureau power in the region and have passed on to your customers the savings made possible, again by contract provision, and at the same time have paid back in taxes 20c out of every dollar of gross revenue, partly to help finance federal power—then the pill is the more bitter. That is the feeling of D. W. Johnston, author of the following article.

D. W. Johnston
Vice-president
Pacific Power & Light Co.
Casper, Wyo.

The Wyoming record of the development and utilization of Reclamation Bureau power provides a most outstanding example to illustrate the gross inequity of the position taken by the present-day preference customers of the bureau and of the preference clause itself. A review of a 30-year history of private utility operation throughout the state will give an appreciation of the position of Mountain States Power Co. (Now Pacific Power & Light Co.)

The case of Mountain States Power Co. is typical in many respects of other private utilities throughout the state of Wyoming as well as in adjoining states. It will illustrate the cooperative program pursued by this company with the Reclamation Bureau in the development of Wyoming reclamation projects and will demonstrate why the company has not up to this time built large generating plants of its own. It will show why it came to be so largely dependent upon reclamation power for its basic supply, why we feel that we and our 30,000 consumers are rightfully entitled to the continued use of this power supply and why we resent the efforts of the so-called preference customers of the bureau, at this stage of the game, to take this power supply away from us.

Prior to 1925, three federal reclamation project dams had been constructed in central and northern Wyoming, on each of which a power development had been made as a by-product to the primary purpose of the installations—irrigation. On the two older developments, power plants had been installed to furnish power for the operation of electric draglines in irrigation canal construction. Upon completion of the canal construction program, electric power output became surplus. A few small consumers had been connected to the transmission lines supplying the draglines but the demand and revenue therefrom was not sufficient to support profitable operation of the reclamation plants, at times not sufficient even to pay operating expenses.

In the meantime, Mountain States Power Co. had acquired a number of isolated electric systems throughout the area, each supplied by its own individual power plant, some steam, some diesel and some natural gas. Apprehension was held at times that congressional appropriations for the year-to-year operation of the reclamation plants would be denied because of revenues therefrom not being sufficient to cover operating costs. In a spirit of cooperation Mountain States worked with the Bureau of Reclamation toward an arrangement whereby the company would consolidate its loads by construction of transmission lines interconnecting its various isolated properties.

The agreement provided for the discontinuance of all the company's small generating plants and the diversion of all its load requirements to the reclamation plants. Furthermore, the government agreed to turn over to the company such retail customers as it had been serving from its construction power system, together with all transmission, distribution lines and substations serving them. The government assumed the position of producer of by-product hydroelectric power and the company fulfilled the responsibility of distributor and retailer.

Throughout all the years that followed the company, by contractual provisions in its contracts with the bureau, agreed to utilize bureau power to the maximum degree possible for its system supply to the exclusion of building power plants of its own.

In evidence of the company's consistent implementation of this policy, reference is made to the various and consistent provisions contained in this company's contracts with the bureau for practically its entire Wyoming power supply throughout the past 25 years. All of these explain the cooperative efforts of the company to utilize and provide a market for reclamation developed power and provide power revenues to the government for the promotion of its reclamation program in Wyoming.

During this period the company has executed and operated under some 10 primary power contracts with the bureau, every one of which, from the beginning, has contained clauses reading substantially as follows: "The contractor (meaning the private power company) agrees to take, receive and purchase from the United States all of the electrical energy which it requires and utilizes on its . . . transmission system . . . and United States agrees to furnish such electrical energy." To cite another typical clause: "The United States agrees to furnish, deliver and sell all of the electrical energy which the company re-

quires and utilizes on its . . . system and the company agrees to take, receive and purchase from the United States all of the electrical energy it requires for and utilizes by its . . . system." Still a further clause reads: "The contractor agrees that it will . . . purchase its system energy requirements in lieu of operating its own generating equipment."

From all of the above it will be readily observed the company's efforts to cooperate with the government in the disposal of its surplus and by-product power production to the exclusion of building plants of its own.

Material savings and economies naturally resulted from the interconnection of the company's properties and load centers, the discontinuance of the small isolated plants and the purchase of wholesale power in quantity from the reclamation plants. Loads grew rapidly under an aggressive power sales program pursued by the company; operation of the government plants was quickly restored from the red to black and in the years that followed Mountain States Power Co. became the largest distributor of Bureau of Reclamation power in the intermountain region under a mutually and eminently satisfactory working agreement.

Utility's Record

In evidence of such growth and development of large power revenues for the bureau, we need refer only to the record of the company's gross power purchases from the bureau from its beginning in the year 1925 through the past calendar year of 1953. The record shows the consistent growth from a mere $4,000 paid to the bureau for all of its Wyoming power purchases in the year 1926 to the $1,108,000 purchase of such power from the bureau in the year 1953, with the total purchases to date now exceeding $9,000,000.

Under the cooperative plan above described, the company's thousands of Wyoming customers have enjoyed all benefits of government - produced hydro power *plus* the many contributions to service and tax revenues emanating from a privately operated power distribution system.

The company is now serving approximately 80% of the electric consumers in its service area. Rates to these consumers are now less than one-third what they were in 1925 when the cooperative program was initiated. The agreement with the bureau provided that all savings arising out of the utilization of bureau power were to be passed on to the ultimate consumers. This to a large degree accounts for the low rates now being enjoyed by the company's thousands of customers, with no increase in rates having ever been made during all the recent years of inflationary costs.

Furthermore, the company has paid back to the government in the form of taxes over 20% of its total gross revenue, representing more than four mills for every kilowatt-hour sold by Mountain States in Wyoming. The same can be said of all of the other private utilities distributing reclamation power throughout the state.

So we come back to the present-day situation relating to the inequities of the so-called preference provisions in the disposal of federal power. Existing laws, previous administrative policy and directives provide that preference in the sale of government power be given to public agencies, cooperatives, etc., all to a large extent enjoying tax-free status. Whatever benefits there may be are thus extended to the customers of these public agencies and would be denied to the customers of the private distributors. Thus approximately 80% of the taxpayers as customers of the private agencies would be discriminated against, yet their taxes would be used to provide such benefits for the remaining 20% as customers of the public agencies.

The ultimate consumer served by either the public or private agency is, after all, one and the same citizen, entitled to the same consideration and without discrimination. Both pay the same rates by and large. The one who is paying the electric bills to the tax-paying distributor has over 20% of his payment diverted to the support of government and is consequently relieved of just that much in payment of his own taxes, whereas as a customer of the tax-free distributor no part, or at least a negligible part, of his payment for electric service reaches the tax coffers.

The preference now claimed by the public distributing agencies is based on their being so-called nonprofit organizations. It is well known that in the regulated private utility industry there is no such thing as profit, in the sense commonly attributed to this word. There is nothing more than a reasonable and legal return on actual invested capital, just simple wages for money invested in necessary facilities to serve. It is no different than the interest paid on the invested capital borrowed from the government by the public distributing agency. Also it should be kept in mind that the customers of the private utility distributors are the beneficiaries of any low-cost government - developed hydro power. Under regulation, the companies cannot pocket any such advantages in power cost. They have to be passed on to the ultimate consumer.

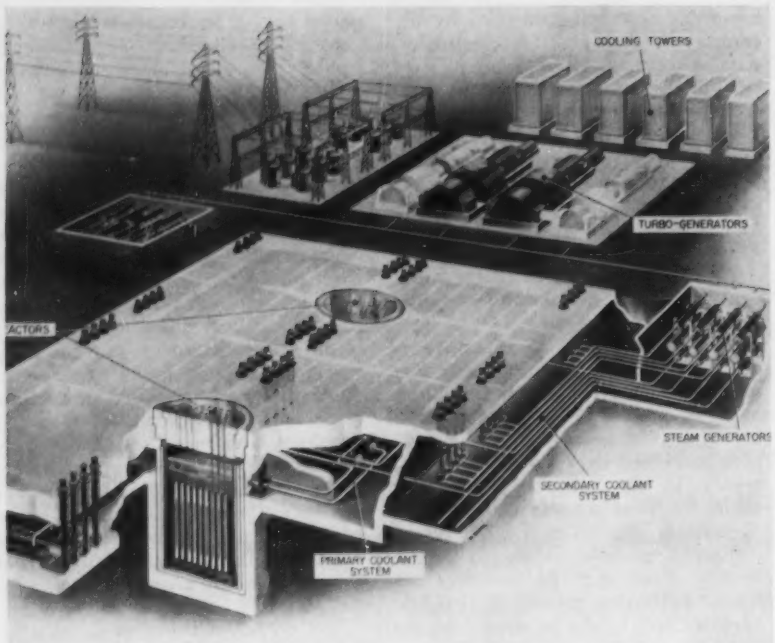
No reflection is intended on the rural electric program in general. In Wyoming my company has a long record of cooperation with the REAs, fully appreciating that electric service to a large portion of the farmers and ranchers in this sparsely settled country could not be provided without some form of subsidy. The company has provided and still is providing extensive wheeling facilities over its lines to the rural substations. The company has entered into many cooperative agreements with the REAs themselves, respecting service facilities, operating problems, division of service territory and other matters. The only disagreements have arisen out of large power service to heavy industrial consumers, which the private company has not considered the constituted function of the rural electric program.

Discrimination

The private utility industry here and throughout the country feels that the preference clause discrimination is unjust, indefensible and intended to socialize the industry. The 80% segment of our population as customers of private utilities would rise up in revolt against this discrimination were the preference clause actually invoked and their fair share of government power denied them merely because they purchased it through a private distributing agency. While this policy has not yet been invoked as affecting my company's Wyoming operation, yet, if the demands of the preference customers were acceded to, all of the government power supply to such distributors as ourselves in Wyoming would be withdrawn. Our thousands of customers would have to pay any increased cost of power that might arise from steam generation or from other more expensive sources.

Federally produced hydro power has its proper and rightful place in our economy in the conservation and utilization of our natural resources and particularly here in the West as incidentally produced in conjunction with our great reclamation projects. We subscribe to the premise that power developed in connection with such projects should be made available to the greatest number of our taxpaying citizens without discrimination. This objective cannot be realized in the face of the interpretations and claims being applied to the preference clause by the public-power advocates.

It is felt that the Wyoming record constitutes a potent argument in opposition to such discrimination.



Proposed layout for atomic "boiler" power plant using dual sodium graphite reactors

Five Reactor Types Compared*

There does not exist today an operating nuclear power plant that can produce power at a cost sufficiently low to represent a prototype for significant additions to existent generation capacity. The development of such a plant is a specific objective of this nation's power reactor program, an objective that is being sought in many directions.

There is an important factor, sometimes underrated, in comparisons between the five major reactor types which have been selected by the Atomic Energy Commission as being most likely eventually to achieve economic power production. This factor is the time scale within which the technological problems inherent in each design are likely to be solved and the time required for placing into operation a full-scale version of these plants.

The most recent semiannual report of the AEC places the five types of reactors into three time groups. Of longest range, presumably not ready for large-scale experimental testing in less than five years, are the fast breeder and homogeneous reactors. In the middle range, that is, ready for testing in about five years, is the boiling reactor. Of short range, ready for testing in two to three years, are the pressurized water and the sodium graphite reactors.

These differences in time scale reflect in a great measure the differences in technological certainty concerning the essential features of these reactors. Because of the time required for the economic and technical development of such complex engineering devices, it is quite apparent that even with the short-range reactor designs several years will elapse before such plants can be considered as reliable contributors to power production.

When one attempts to determine which of the above reactor types is likely to be the most successful commercial power producer, it becomes quickly evident that at the present time the areas of uncertainty, in both engineering performance and costs, are so large for all of these plants that no amount of paper analysis can guarantee a proper choice. In fact, the cost of power from any of these types of reactor plants can not be reliably estimated for either comparison among themselves or for comparison with conventional plants. However, a conservative estimate of the probable cost of power from these nuclear plants places them in the same "ball park" as the conventional plant—and if some degree of optimism is permitted to enter the cost considerations, it appears that at some future time any of these plants might possibly compete very successfully with conventional plants.

The choice, therefore, of a nuclear power plant design on which it is advisable to concentrate effort involves both the problem of time scale and also basic technical philosophy as to the most productive lines of development. It has been the opinion of our organization that, because of the short-range possibilities of the sodium graphite reactor (in fact, full scale plants could be built today, although not in their most optimized form) and because the probable lines of development may make it a successful competitor with other reactor types in the long term, this type of reactor represents a "best" choice at present.

In any analysis of the cost of power from nuclear plants it is clear that the fixed charges tend to dominate these costs and that the area most susceptible to development is the capital investment (in the nuclear reactor and heat extraction systems) and the thermal efficiency of the plant. In a typical nuclear plant, up to three-fourths of the fixed charges per kilowatt-hour are directly dependent upon the thermal efficiency of the plant. The remainder is generally proportional to the total amount of power produced. There is therefore, in a nuclear plant, as great an incentive to achieve a high thermal efficiency as there is in a conventional power plant. In addition, there is an equally great incentive to reduce the capital investment in the reactor portion of the plant.

Sodium for Heat Transfer

Both these objectives are assisted by the use of a liquid metal such as sodium as a heat transfer system. While solid at room temperature, it melts at 208 F and is therefore easy to keep liquid in a power plant system. Because liquid metals, sodium in particular, have extremely high thermal conductivity, they are excellent heat transfer media. The fluid dynamics of liquid sodium is similar to that of water. A further advantage of sodium is the general absence of chemical corrosion in metal systems. As a result, a wide variety of steels and other alloys may be utilized as construction materials. It has, however, certain disadvantages. It reacts chemically with oxygen and water. Further, when ex-

* As presented by Dr. Chauncey Starr, North American Aviation Inc., Downey, Calif., before a recent meeting of the National Industrial Conference Board at New York.

posed to neutrons as in a reactor, it becomes a strong radioactive gamma ray emitter with a half-life of about 15 hours. This problem of induced activity in sodium creates its most serious handling problem in nuclear power plant applications.

Because of the above general characteristics of sodium, we believe that the engineering development of the sodium graphite reactor and its heat extraction system eventually will permit: (1) the production of steam temperatures that will be limited only by turbine performance and (2) the simplification of the reactor cooling system to an extent approaching low-pressure water systems. As a matter of engineering philosophy, therefore, we have great faith in the potential capabilities of the liquid sodium cooler reactor.

Sodium System Expensive

It should, of course, be recognized that at the present time a liquid sodium system is an expensive item. The present cost of a sodium heat extraction system is roughly equal to the cost of the reactor alone. This is, however, primarily because the components of a liquid sodium system presently involve laboratory-type fabrication and instrumentation, and unusually tight specifications on detail. However, it is quite evident to those concerned with this particular technology that these present high costs will rapidly disappear as industrial practice in this field is developed.

A further factor that makes the liquid sodium graphite-moderated reactor an attractive choice is its inherent safety characteristics. For the eventual development of the nuclear power field it is clear that both the public at large and the capital investment in the reactor must be protected. Protection of the public requires that under no possible conditions may the radioactive materials produced in a nuclear power plant be dispersed. Every nuclear reactor contains a large amount of radioactive material. However, dispersion of this radioactive material is not a necessary consequence of an accident unless a major source of energy is present which forces such dispersion. Generally, the most consequential force behind dispersion is not the nuclear energy released in an accident, but is either the potential energy stored in pressure systems or the chemical energy that might be released through thermodynamic chemical interaction of the reactor and cooling system components. In the case of the sodium graphite reactor the complete absence of stored energy because of pressure and the absence of chemical reactive substances minimize the energy available for dispersion of radioactive material. Further, as with most reactors of this type, the inherent negative temperature coefficient produces an intrinsic stability which tends to inhibit reactor accidents. It is our conviction that experience with this type of plant will demonstrate its very high degree of inherent safety.

One important aspect of all the various reactor proposals is their flexibility in relation to the various types of fissionable materials that the reactor could utilize and their possible integration with the operation of the AEC fissionable material program. The various reactor designs have differing merits in this regard. The sodium graphite reactor can utilize either slightly enriched uranium fuel or thorium initially enriched with U235.

The utilization of thorium in the sodium graphite reactor system has advantages which, again, are associated with the liquid metal coolant. The metallurgical properties of thorium metal are such that they permit a higher temperature fuel element operation than is likely to be achieved with uranium. The liquid sodium coolant system can take advantage of this characteristic to provide improved steam conditions to the turbine. Although this area of fuel element performance at high temperatures has not been sufficiently explored to determine all the characteristics involved, we believe that the use of thorium in the sodium graphite system offers valuable nuclear and economic possibilities.

In the AEC program for exploring these various reactor types it is planned to build experimental plants that will yield technological information, performance data and capital and operating costs on the various reactor types. It is not expected that any of these experimental reactor plants will produce economically competitive power because of their small size, experimental nature and novel technology. The experimental reactor for the sodium graphite reactor system has been called the sodium reactor experiment and is presently being built as a jointly sponsored project of the AEC and North American Aviation.

The sodium reactor experiment will be located at North American's field laboratory in the Santa Susana Mountains, 30 miles northwest of Los Angeles. It is expected to be in operation the early part of 1956. The reactor reproduces at a low heat output—20,000 kw—the major feature of the sodium graphite power reactor design. The heat transfer systems, fuel handling system and instrumentation and control systems are all included.

The conventional parts of an electrical generating plant, the steam and turbogenerator unit, are not presently included in this experiment. The reactor for this facility incorporates sufficent flexibility to permit performance tests of different fuel materials and fuel configurations and the development of various types of mechanisms and operating techniques. This particular reactor contains an active core that is roughly 7 ft in diameter and 6 ft high. For reasons of experimental flexibility the power output from this core does not represent the maximum that can be achieved from this unit. It would be possible with this same core to produce roughly four times as much heat if the sole purpose were power generation.

The conservative design that has gone into the sodium reactor experiment can be applied today to a larger-scale plant. For example, if this experimental reactor were enlarged to a 10-ft-high, 11-ft-diameter core, such a unit could be operated so as to produce about 350 mw of heat and about 100,000 kw of salable power, in addition to a considerable production of by-product plutonium.

Reactors in Parallel

For central station application it might be desirable to operate two such reactor cores in parallel. The use of twin reactor cores rather than one large reactor results in a plant with a higher availability. The plant can be operated to 50% rating during fuel loading and unloading or at times of low power demand. Each reactor will have its own controls, piping, pumps and heat exchangers so that it can operate independently of the other; however, the same building, loading and unloading mechanism, and fuel storage facilities will serve both reactors. The steam conditions would be in the range of 750 to 1,000 F, depending upon the economics of plutonium production and fuel costs. The capital cost of such a plant might today run between $250 and $300 per installed kilowatt.

North American considers such a plant feasible today as it would be a straight-forward extrapolation of the sodium reactor experiment presently being built. It is anticipated that the developments and experience that will result from the sodium reactor experiment will permit major improvements in performance and costs. With a full recognition of the fact that today's costs for such a plant would be higher than they might be after the accumulation of additional experience with the sodium reactor experiment, there is no basic reason why, from an engineering viewpoint, a large-scale power producing plant could not be built now.

There Is Need for

Common Sense on Air Raid Warnings

Homer G. Keesling
Utilities Coordinator
California Office of Civil Defense

Utilities wish to cooperate in civil defense but oppose the many impractical ideas being offered to the public

So many air raid warning schemes are being proposed, which would involve electric distribution systems and telephone facilities, that it seems appropriate at this time to discuss and point out difficulties with some of these proposals. Many of these schemes are being advanced by those who have little knowledge or appreciation of utility operating problems. Hence many plans are entirely impractical from the standpoint of cost, operating difficulties or effectiveness.

The electric utilities and the telephone company are having schemes sprung on them out of a clear sky, with no opportunity to point out their impracticability until the public or someone in Washington has taken them seriously. Civil defense is a vital national problem. The utilities are greatly concerned and are cooperating fully whenever possible with federal, state and local agencies.

The utilities have no desire to oppose the various ideas suggested. They are, nevertheless, being placed on the defensive with ill advised and totally impractical schemes. The result is that progress toward a sensible solution is being retarded and utilities' goodwill is injured. It is the purpose here to mention some of these schemes, to point out their weaknesses and to offer some constructive thought on how the problem might logically be approached.

Changing Frequency

Frequency juggling has been proposed as a certain way to alert every customer of the power companies. An alarm has been devised that would be provided for every home and which would operate whenever frequency would be raised 2½ cycles, or if preferred, it could be designed for a reduction of 2½ cycles.

One of the objections to the raising frequency device is that the power requirement for operation of equipment at the higher frequency increases very rapidly. On an extensive interconnected system, there would be a need for far more reserve capacity than could be readily made available. On a large system there could be as many as 50 to 100 regulator adjustments needed, which would require considerable time after the notice was received. The time needed to get word to the 50 or more plants in such a system might easily be an hour or more. An alarm by frequency raising would not only be much too slow to be of value but would also have the disadvantage, on a large system, of alerting a much greater area than might be in jeopardy.

Objection to the lowered frequency scheme is substantially the same as for raising frequency, with the added hazard of false alarm because of system slowdown caused by transmission or other normal faults. Many loads are of such a nature that any frequency change on the order of 2½ cycles would produce plant shutdown. Communication would be in many cases interfered with, at a time when interference should be avoided.

Voltage Variation

Voltage raising and lowering has also been proposed. This operation would be most difficult to perform since many distribution circuits are automatically regulated at various points along the line, and changes cannot be made quickly. Voltage disturbances because of electric system line faults probably would produce false alarms.

Circuit interruption has been suggested. This plan would work enormous hardship upon the public since, for dispersal, all elevators, transportation, signals, communication, etc., should be operative. The time required for circuit opening would be considerable, particularly as many substations are fully automatic and operate without attendance.

Carrier Frequency

The use of a frequency higher than 60 cycles superimposed upon distribution circuits, as is commonly done for street light and water heater control, has been proposed and an alarm has been developed for home use. Such control schemes are generally used with distribution feeders from attended substations and, in the general case, considerable time is required to apply signal energy to the individual phases of the various circuits. A large amount of equipment is required, both in the power stations and on the lines; station equipment may require considerable space which is not always available, as well as a great deal of money. If this alarm scheme were to be installed in unattended stations the complexity, cost and space requirement would be even greater.

A committee appointed by Edison Electric Institute worked for many months on the frequency change and carrier schemes but could not find any possible hope of successful application, and reported adversely to the Federal Civil Defense Administration on April 2, 1954.

Most city and county civil defense headquarters and many utilities are making use of special circuits furnished by the telephone company. This bell and light system, however, does not lend itself to the alerting of homes. Many schemes have been suggested for the use of telephone facilities for home alerts. The simultaneous ringing of all bells is one plan suggested, with possible vocal instruction upon the lifting of the receiver.

A plan recommended by the EEI committee, and now used by some utilities in addition to the bell and light system, is the installation of radio receivers permanently tuned to the normal frequencies of 24-hour broadcast stations. These receivers produce alarms when the broadcasting stations receive alert warnings and change to the Conelrad frequencies of 640 kc or 1,240 kc.

Receivers turned to the Conelrad frequencies may also be used, the alarm in this case being produced by the initiation of the Conelrad broadcast. This system has the very desirable advantage that speakers can be used to give instructions to the alerted public. Receivers to be used in this manner could be mass produced at small cost and would be acceptable, no doubt, to the public.

Alerting of the householder is particularly desirable, because present-day planning is for dispersal. Since distances are great and time may be short, an early start is essential. Inasmuch as the problem is essentially one of communication, it can no doubt best be solved by the men and facilities of the communications industry.

Interrupter switch with linkage to blade of disconnecting switch is mounted on pad on post insulator at hinged end of disconnect

New Interrupter for Line Dropping

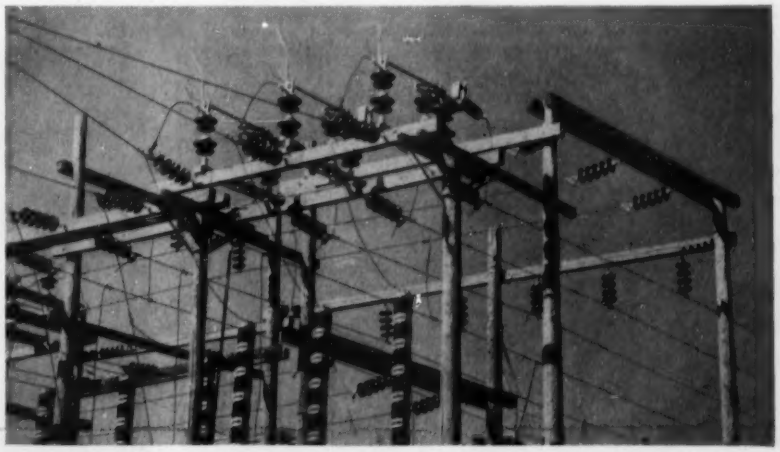
A small new, inexpensive oil-blast interrupter operating in conjunction with a high-voltage disconnect switch has proved an economical solution to a switching problem on the system of the Southern Nevada Power Co. at Las Vegas, Nev. The accompanying photographs show installation of the interrupter.

The problem arose out of the occasional necessity of dropping a 69-kv, 13-mile line at the utility's San Francisco substation. The line is one of the feeds for Hoover Dam power and is supplied by a 37,500-kva bank at Henderson, near Las Vegas. Breaking the charging current even of this short length of line had proved hazardous and entirely beyond the duty of the conventional air-break disconnecting switch at the Las Vegas end of the line.

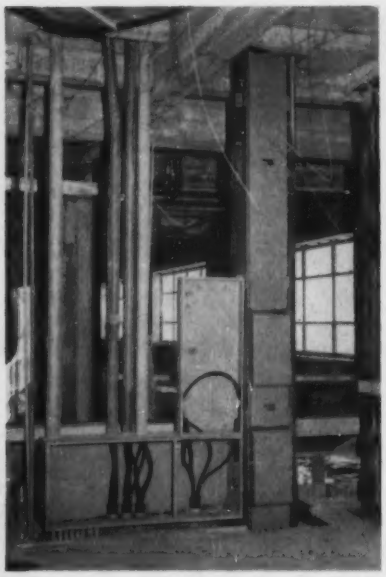
With the new interrupter, made by Schwager-Wood Corp. of Portland, the problem has been completely and inexpensively solved. The principle employed in the interrupter is now in the oil-blast interruption of an arc.

As may be seen, the interrupter is mounted on a metal pad bolted to the top of one of the insulators at the hinged end of the disconnect. An adjustable linkage between the blade of the switch and the interrupter causes the interrupter to open the circuit before the contacts of the disconnect open, and to close the circuit after the disconnect contacts close. In addition to breaking the charging current of the line, the interrupter has been used to break up to 125 amp of paralleling load current.

The interrupter is a class A device with current rating of 600 amp. It is not designed to interrupt fault current but instead the charging and load current of long high-voltage lines and the exciting current of transformer banks. At voltages higher than 115 kv two of the interrupters are used in series. An installation of this kind on a 100-mile, 138-kv line will be described in a subsequent article. Another application of the interrupter is being made in conjunction with the air-break by-passing switches on a bank of series capacitors on a 230-kv transmission line. This installation also will be described as soon as completed.



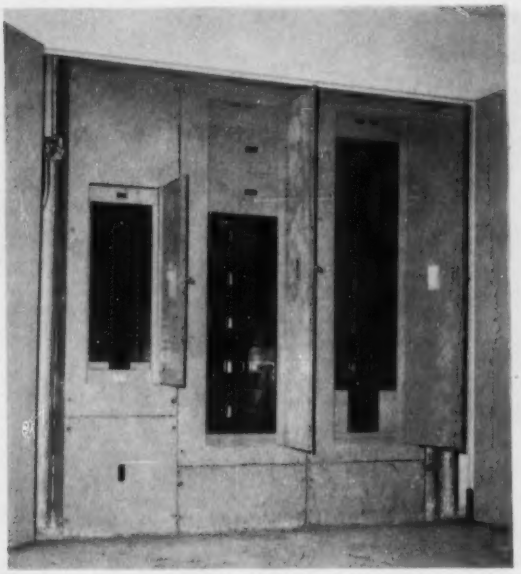
Interrupter switches for dropping 13-mile, 69-kv line and 37,500-kva transformer bank

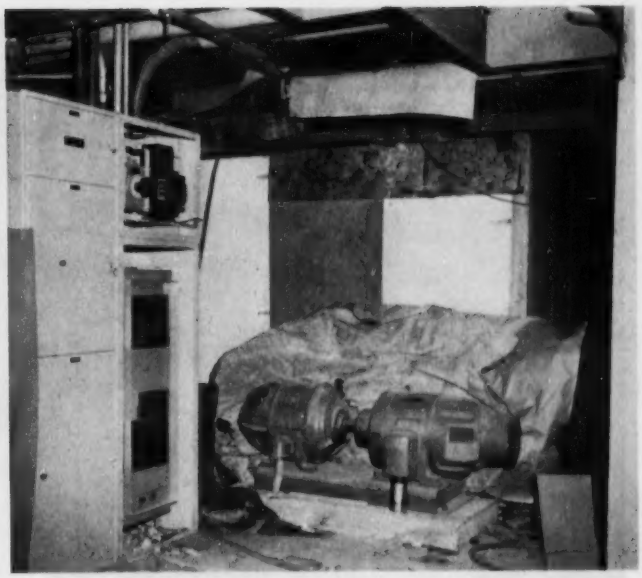


"Nerve System" for New U-C Hospital

University of California is building a complete medical training center at its Los Angeles campus and adding two buildings to its San Francisco hospital, a Teaching Hospital 15 stories high and a Medical Science building of 14 stories. Laid bare as though for surgery here are views of the electrical "nerve system" of the Teaching Hospital for which the installing "surgeons" are Abbett Electric Co., San Francisco contractors who are also completing the UCLA center buildings. Clyde Bentley Co. was the electrical engineer doctor. Above, Conrad Abbett stands beside the three emergency lighting panels and regular lighting panel for the fourth floor operating and cystoscopy rooms. All lighting and convenience outlets in the surgery operating rooms are served by this bank of three 25-kva 120/208 to 120-v isolating transformers shown above in the center picture. The right upper photo is of bus duct riser (one of four similar risers) and cable pass-through box from it to panel boards later installed there. Cable supports for vertical runs of cable are also shown in the box

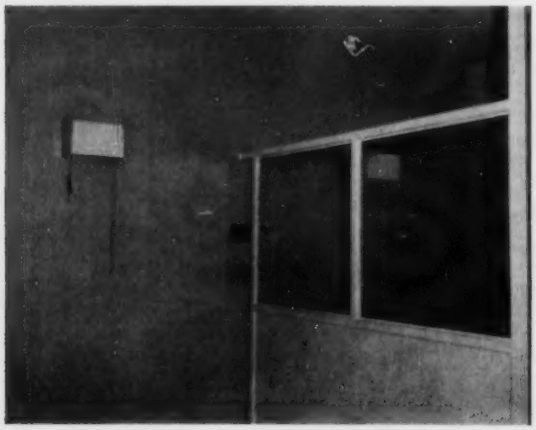
Below, left, the runs of bus duct in the basement corridor ceiling between the main transformer vault in the adjoining Medical Science building to the main switchboard, below, right, in the Teaching Hospital building. The four bus ducts are: a 1,600-amp, three-phase power bus; a 3,000-amp four-wire lighting bus (the flush mounted fluorescent corridor lighting units); another 3,000-amp lighting bus duct and a 1,000-amp two-pole X-ray feeder. The main switchboard has four 1,200-amp breakers, a 1,000-amp breaker and one 800-amp breaker on the lighting section (120/208 three-phase, four-wire); and on the 480-v three-phase power section it has one 600-amp and five 400-amp breakers. Electric systems include lighting, power, emergency lighting, X-ray system, isolated system for operating rooms, nurses call, telepaging, office intercommunication, doctors' registry system, telephone, clocks and a television raceway with chrome-plated pullboxes for television outlets to serve cameras above the operating table in the surgery amphitheater

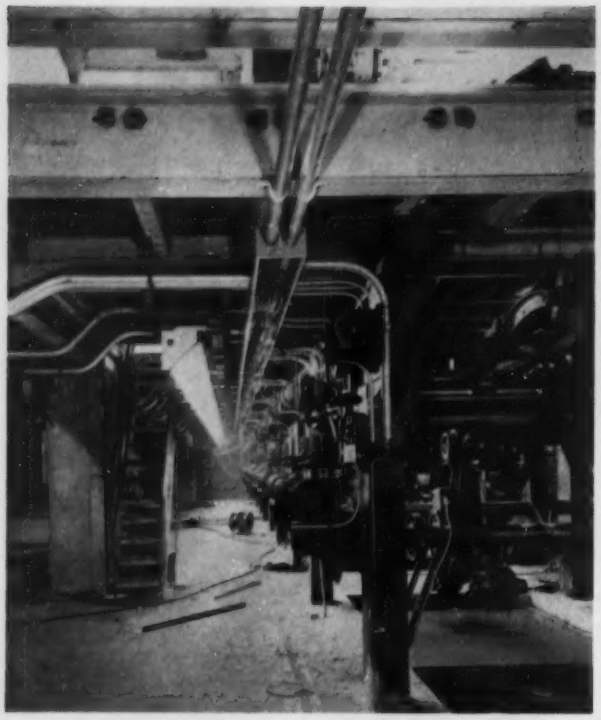




As the building neared completion (it was begun in the fall of 1950 and will be occupied by January 1955) the finished panels appear as shown above at left. Such panels are fed from the 1,600-amp bus duct riser. Branch circuit breakers range from 125 amp to 225 amp. At right, above, the emergency motor generator set and panel (25 kva) at installation. On the right is the group of buildings making up the San Francisco medical center. The Langley Porter clinic is on the left, the new Teaching Hospital in the center, Medical Science building behind it and the present clinical facilities are seen in the distance. The group is part of a future $25,000,000 center. Electrical work for the Herbert C. Moffitt Teaching Hospital ran to about $600,000

Because it is a teaching hospital, many of the facilities are increased over those needed by an ordinary hospital in order to aid in the teaching of potential doctors for the future. An example is seen below, right. This is one of four similar groups of X-ray film illuminators on the third floor where the X-ray equipment is located. Each light box will be illuminated by a circline fluorescent lamp and will be individually switched. At the left below is the wall light for upward and downward light over a bed in a typical two-bed room. Duplex convenience outlet, nurses call station, are in the wall at the partition above oxygen taps. Electrical contractor for the adjoining Medical Science building was Ets-Hokin & Galvan, San Francisco





Exceptionally large number of bends and offsets for press conduit runs were made at time savings with this hydraulic jack-type bender

Bender Speeds Job, Saves Money on "News"

With high wage scales, time costs money to an electrical contractor. Hence methods or devices to reduce time are of cost interest.

Use of conduit of large size, bent on the job, as against elbows and cut lengths saved considerable time in the installation of 10 printing presses for *Rocky Mountain News* in Denver by E. P. Allison Co., the contractor, according to Robert B. Burton, its superintendent. On this job, with 96 bends, it saved $79.36 in materials and 43½ man-hours. Equipment used in this case was the Tal Bender Co.'s One Shot bender, equipped with a long ram, half circle shoes and bend indicators so that any degree of bend could be made in one operation, without moving the pipe.

Ten Hoe printing presses were installed in the *Rocky Mountain News* in its new Denver building, designed and built by the Austin Co. Typical of printing press installations, there was very little clearance and working space between the presses so all bends had to be exact in size and direction. The bend indicator assured this.

The picture shows part of the installation. Hardly any elbows were used. The accompanying table shows the number of 90° bends, each of which saved two cuts, two threads, one elbow and two couplings, plus the assembling and hauling. Many offsets were likewise made with the bender. The five-month time limit was shortened by installing the job in 4½ months. On this job before a 3-in. bender was received, five 3-in. elbows

Time Savings with Bends Instead of Fittings

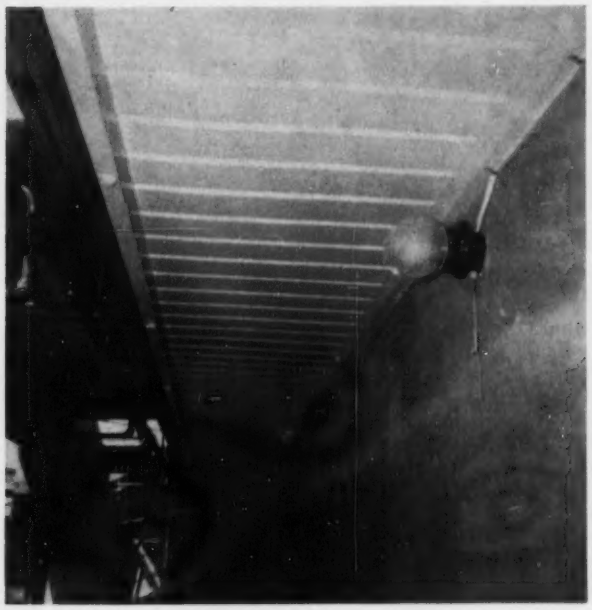
Size	90° Bends Made	Time Per Bend (Minutes)	Time For Fittings, Elbows (Minutes)	Total Saving (Minutes)
1 in.	22	10	35	300
1 ¼ in.	17	10	40	510
1 ½ in.	20	15	45	600
2 in.	28	20	50	840
3 in.	9	25	65	360
Total	96			2,610 min. or 43½ hr.

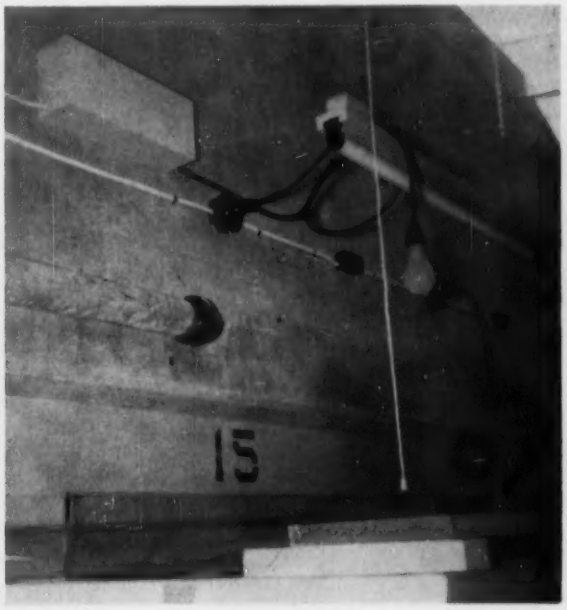
Materials Savings Effected on This Job

Size	Conduit Used Instead of Elbows	Cost of Elbows And Couplings	Total Savings
1 in.	$ .33	$ .62	$ 6.38
1 ¼ in.	.48	.89	6.97
1 ½ in.	.70	1.20	10.00
2 in.	1.05	1.80	21.00
3 in.	2.76	6.65	35.01
Total material saving			$79.36

were used. The cost of these elbows in time was five hours and five minutes, and in material $33.25. If bent conduit had been used instead, the time would have been two hours and five minutes and material cost $13.80.

The question often asked is how bent conduit can be turned in restricted area. With a little thought this can be done. The pipe may be screwed together on the floor and then put in place. If it is a long run the pipe is pulled away from the wall as far as necessary to turn the bent pipe in place. In an extreme case, if there actually is not sufficient room to turn a bent full length of conduit into place, it is still far cheaper and quicker to cut the bent conduit to such size as to make it possible to turn it into the restricted area and then connect to the end a straight piece. This will gain one cut, one thread, one elbow and one coupling.





SALT AIR CORROSION is probably as severe as anyplace on earth in the new aquarium being built by the city of Honolulu on Waikiki Beach. To light the fish tanks and the corridors back of them presented more of a wiring than a lighting problem. E. L. Ralston Jr., Hawaiian Electric Co. engineer, who aided the city in the design of the electrical facilities, urged as complete a nonmetallic installation as possible and it was put in. At left, above, corridor lighting units in plastic canopies and outlet boxes, fed by plastic covered nonmetallic sheathed cable, held by plastic straps. At the right, cable, plastic outlets and neoprene cords for incandescent lamps over the fish tanks; ballast box and cord to fluorescent corridor light; everything accessible for replacement

HIGH AND LOW CEILING — A 25-ft ceiling over the main banking area of the First National Bank of Santa Fe, N. M., called for special treatment from Architects Meem, Zehnar, Holien & Associates; the general contractor, Robert E. McKee, and electrical contractor, Reynolds Electrical & Engineering Co. Top-serviced Sunbeam recessed fluorescent fixtures with Holophane Controlens were laid out in a pattern by the architects. Access to them for relamping is from catwalks above the ceiling. The air conditioning system was worked into this pattern as shown in the picture at left. For the working area for bookkeepers and tellers under a nine-foot dropped ceiling 90 foot-candles is provided from units set at right angles to the wall and the ceiling equipped with acoustical tile of off-white color. The lamps used here are de luxe cool white, rapid start fluorescent. The lenses over the recessed units direct some light on the ceiling to reduce contrast between unit and ceiling. Average intensity over banking area is 50 f-c despite height

As long as it's being rewritten Gerber tells Brandon why he . . .

Two more dynamic contestants over the National Electrical Code than Merwin Brandon, chairman of the electrical section, NFPA, and Harold L. Gerber, San Francisco consulting electrical engineer and former inspector, cannot be found in this industry. At inspectors' meetings when the two are present the exchange of comments, witticisms and technical details is fast and sparkling. Recently Gerber was rendered hors de combat (out of the ring) by illness and thus unable to attend and participate in the last IAEI convention. But he was only taking the "long count" and his thinking machinery was still clicking.

Copies of a rewriting of the NECode being undertaken by Frank Thornton Jr., retired, long a member of the code-making panels, were sent to Gerber by Brandon. Thornton's instructions were to re-edit and make more understandable and rearrange for clarity the present code without changing its meaning.

In this exchange of letters Gerber makes a case for some much needed revisions as well. Brandon answers to differentiate between what Thornton is doing and what Gerber advocates, and answers a couple of Gerber's points. To anyone concerned daily with the code both are worth reading. The practical men in the field dealing with the problems on which the code is still far behind will agree with Gerber that a modernization and spring cleaning is very much needed. Like him, they deplore the slowness of the code to catch up with practice.

Wants a Spring Cleaning on the Code

Dear Mr. Brandon:

Your copies of the proposed re-editing of the National Electrical Code were received with interest and a review of the same indicates the clarification or rephrasing of a paragraph or section, but in my opinion is resulting in a code that will be more voluminous and confusing than previous editions.

I believe the editions of the National Electrical Code should be as progressive as the electrical installation it controls. Each section that is progressive should describe and govern its electrical provisions. Sections that are becoming obsolete should be shortened or abandoned. Existing sections that are expanding should be increased and sections that contradict each other should be corrected.

Before any tables governing insulation resistance, current flow to ground or similar governing sections are adopted, I believe that specific tests should be made to make certain that such values can be obtained under practical installation conditions.

There are many sections of the code to which engineers and inspectors pay little or no attention. If this is the case and there are no harmful effects resulting from this action then it is time that some consideration be given to the deletion of these sections.

The writer has had many years' experience both as a designing engineer and as an electrical inspector, designing and supervising practically all types of major electrical installations. It is my opinion that the re-editing and revising of the code should be made by parties having a similar over-all experience.

In order that I may clarify the intention of this letter, I will quote a few examples.

1. Section 1115—Interrupting Capacity. One of the important sections of the code, dealing with capacities of primary and secondary services, transformer bank rating, cascading of air-type circuit breakers and rupturing capacities of other types of electrical control devices but this important subject is covered in a four-line paragraph.

2. Section 1119—Insulation Resistance. For a No. 4/0 feeder with all fixtures and equipment installed; one-half of 25,000 ohms or 12,500 ohms. On feeders of 120 v to ground, this limitation would permit

$$\frac{120\text{ v}}{12{,}500\text{ ohms}} = 0.009\text{ amp or }9\text{ ma}$$

yet Section 5135—Combustible Anesthetics, paragraph 5135f—Circuits in Anesthetizing Locations—limits leakage currents to 2 ma. To this date and as described in my last letter to you, this is an impossible installation condition unless made at greater cost by dividing the installation into smaller isolated groups, a condition not covered in the NECode or by the NFPA.

3. Section 2113—Voltage. A few sentences in this paragraph describe one of the most progressive electrical changes made in the code, permitting in industrial installations, office buildings, large schools and stores the installation of lighting circuits of not more than 300 v to ground, yet all of this is covered in a section of one paragraph.

Under this it is possible to install 240-v circuits, 277-v circuits and 480-v, three-phase, three-wire circuits of not more than 300 v to ground, with installation restrictions and circuit values not governed by other sections of the code. What type circuit can be used in large industrials for fluorescent fixtures with ballasts wired with No. 16 AWG? Section 2403, paragraph D, limits this type to 20-amp circuits. This destroys its practical use in large installations and under these new voltage limitations.

4. Section 2116 — Calculation of Load. This is a section not clearly defined, which leaves questions as to long periods of time. What is to be accomplished? Shall the number of circuits be increased or shall the load in each circuit be decreased to 80% of its full load rating, or shall the proper type of circuit overcurrent protection be increased or be of proper type and design to operate under these conditions? Does it apply also to feeders? This results in multipliers for different branch circuit ratings, is not clearly defined. The result is that there is little or no enforcement of this section.

5. Section 2116 C-2 — Show-Window Lighting. This is a sentence without meaning. There are no mandatory minimum provisions for show-window loads as this is contrary to Section

2203b, and permits a single specified outlet of 200 w to be used for an entire show window. No contractor would figure 200 w per lineal foot of show window if only one specified 200-w outlet is indicated.

6. Article 2203a—Feeders. This sectional table should be reworded or revised. The type of occupancy should not govern the factors in columns A, B and Demand Factor, but rather that section of a building being used as such classifications.

Schools, hospitals, etc., have classrooms, operating rooms, storage rooms, auditoriums, shops, coffee shops, etc. These feeders for each type section should have applicable factors, other than an over-all requirement for the whole feeder.

7. Section 2203f — Neutral Feeder Load. On three-phase, four-wire feeders supplied from wye-wye connected transformer banks and connected to fluorescent ballast-type lighting loads, overvoltage together with third-harmonic conditions results in the neutral conductor carrying full load currents under balanced phase load conditions. This 70% neutral factor should be clarified to cover such conditions.

8. Table 20, Article 460 — Motor Tables and Capacitors. This table is based upon specific motor name plate values for inductive load ratings per motor ampere rating. In large installations, where power factor correction is installed on individual motors and said power factor correction will result in less current per phase conductor than for motors in excess of 10 hp, recognition should be given to this factor. For large motors, it will result in small control devices, raceways and conductors.

Inspectors do not recognize these factors and insist upon the values of Table 20. This should be clarified.

9. Article 445—Generators. An old section dealing mainly with d-c generators. Generators of all kinds with various types of prime movers are now installed in all kinds of hospitals, places of public assembly. These are usually of the single- or three-phase type with various kinds of overcurrent protection, starting and timing devices, control circuits and heating devices. Isn't it about time to re-edit this section?

10. Article 660 — X-Ray. Section 6606. This requirement for disconnecting means of adequate capacity at the X-ray location is obsolete. It requires large disconnects in finished rooms, when a remote-controlled circuit with disconnecting means at other locations is more suitable and practicable.

11. Article 700 — Emergency Systems. An important section with no enforcement provisions, other than by municipal, state or federal codes. Should be a mandatory minimum requirement in places of public assembly so that the rural inspector has enforcement requirements.

Most states, federal government and municipalities have their standards for emergency lighting and do not recognize Section 7015 as complying with the intent of said provisions. This section should be eliminated.

12. Chapter 10—Tables, Diagrams, Examples—Tables 1 and 2. Correction Factors. A section that is practically universally by-passed. Who can properly interpret such a table and its amendatory provisions? Section 2116, which limits continuous circuit loads to 80% of circuit rating, is a factor to be included also. Why are correction factors applied only for room temperatures? What about exterior raceways exposed to ambients far in excess of room temperatures or conductors in radiant heating floor slabs, walls or attic spaces not considered?

For example, a No. 12 AWG conductor of type RH-RW insulation is installed in a floor slab with radiant heating operating at a temperature of 104 F and is in a raceway with eight ungrounded conductors.

20 amp x .82 = 16.4 amp.

7 to 9 conductors – mult. 70% = 11.480 amp or 58% of its original carrying capacity. If aluminum is used, an additional multiplier of 84% is used. Is Table 2116 still in effect with all these multipliers?

It is little wonder that in code meetings these subjects are never discussed.

These examples are only a few of the many that can be included in a letter. The main object of this letter is for your group to consider the various sections of the National Electrical Code both from the viewpoints of the engineer who is trying to design installations for compliance therewith and the contractor or individual making the electrical installation.

If a re-editing or revising of the code is to be made, why not have a real spring cleaning? Remove all old and unnecessary parts or sections, touch up the sections for progressive usage and, above all, let us be modern, get rid of the things of little or no use, and forget about storing them away in some section in order that some day you might find some use for them. Here's to a bright and new spring cleaning!

H. L. Gerber

Dear Mr. Gerber:

I found your letter and comments stimulating as usual. It appears to me, however, that you have mixed up two very different subjects. One is editorial revision of the code and the other is revision *as to intent.*

Mr. Thornton was charged with the work of editorially revising the code, merely to clarify its meaning, and he has attempted to do just that and no more. Where a change in a specific article is proposed, that change must go to the code-making panel for processing and inasmuch as you have sent a copy of your letter to Charles L. Smith, I presume he will abstract such portions as he thinks come in that category and send them to the code-making panels.

Some of your comments are merely personal views as to what might be desirable and they cover items that have been considered by the correlating committee and rejected. For instance, under Article 700, you suggest that the National Electrical Code cover emergency lighting both as to where it should be used as well as to how it should be installed. No members of the correlating committee agreed with that point of view when the subject came up a few years back. It was their thought that building exits codes should indicate where emergency lighting should be used and the National Electrical Code should merely indicate the proper method of installing such lighting where required.

Your comment on correction factors bring up a number of items that are recognized as problems, but the consensus of code panels and previously of article committees has been that only a general guide can be given on temperature limits of materials and then local inspection authorities will have to determine where the special conditions resulting in high temperatures exist.

I hope you have not forgotten the many steps you took as an electrical inspector along these lines. Undoubtedly, it would have been easier had you been provided with a guide that would have obviated the necessity for doing a lot of the independent thinking you did, but I am not at all sure that safer installations would have resulted, nor that a small group anywhere is competent to consider all the various conditions that might arise in this large country of ours and predetermine their treatment. In other words, Harold, I think you are to some extent blowing off steam rather than making serious proposals on some of the items you have discussed.

Your item on combustible anesthetics, paragraph f, 5135, seems to me to overlook the fact that the leakage current of 2 ma is through the ground indicator rather than from the circuit to the ground. Such indicators are available but it merely happens that the one you had on your job wasn't so designed. That doesn't mean it is an impossible installation situation, as you have indicated, it merely means that many of these indicators are of dif-

ferent design and some may not comply with the requirement.

Inasmuch as they are not tested, so far as I am aware, by any recognized testing laboratory, the inspector or user has to determine their suitability. This is not a difficult determination to make. You evidently made it on the sample you had and found it didn't comply. After that it will be up to the producer to obtain compliance or to the user to decide whether he had covered himself properly in his purchase specifications.

I have deliberately, of course, just picked out various items in your letter in an effort to point out the variety of items you have covered. If I had done otherwise and attempted to discuss all of your items in detail, I would find myself writing a handbook on the code and I not only don't have the time for that, I probably don't have the talent either.

I am sending your letter on to Mr. Thornton but, before closing, I am expressing my gratification over noting from the tenor of your letter that Harold Gerber is back on the job again and apparently feeling much improved.

Merwin Brandon

Wide translucent screen, three slide and two movie projectors flashed the effect of . . .

"Chain Reaction" on Business

"How do they do it?" may have vied with the well-told message of "Chain Reaction" as told by Westinghouse Electric Corp. to some 3,500 or more in the 11 Western states. For Westinghouse used every media available in an ingenious and smoothly coordinated combination to show the benefits of commercial and industrial electrical modernization. Audiences were made up of electrical contractors and their customers, building managers, plant owners and managers, superintendents, and electrical engineers, architects, utility commercial and industrial personnel, and the Westinghouse distributing organization.

Theme of "Chain Reaction" is that population growth sparks needs and demands that require business and industry to improve its facilities in order to keep competitive and alive. Using a small city as a typical example, it weaves a story of a tool works president faced with the decision whether to modernize the electrical distribution system, to cut his losses due to breakdowns and high maintenance, or to try to save money but lose business by doing only temporary things. It is a well-told story and contains a wealth of good selling ideas that contractors should use. In another sense, it helped to presell the plant managers and building owners present for the contractors to follow up.

The mechanism of how it was done certainly proved as interesting to the mechanically minded audiences as the story itself. Carrying its own stage setting of curtains and a 21-ft-wide translucent screen, by the use of three slide projectors, two synchronized movie projectors and two loud speakers, and three actors in the flesh, an exceedingly clever correlation of all these elements was achieved to illustrate the story. The movies and slides were projected onto the translucent screen from the rear. A single operator, aided by electronics, coordinated the operation of the movie projectors and slide film projectors in an ever-changing pattern of uses. The two 16-mm movie projectors were coupled together with a chain drive. One provided the movie film and sound for one speaker, the other had sound track for the other speaker and triggering signals to operate the slide films at the proper moments. The live movie film was notched at certain stages to stop both motion picture units automatically. At this point slides took over the screen and were controlled manually by push buttons on the operator's control panel as the live actors talked.

The Western tour of the show began at Denver in October and entered the Pacific Coast region at Salt Lake City Oct. 21, for showing at 22 cities, ending at Phoenix Dec. 3. W. C. Swinghamer, Pacific Coast regional advertising and sales promotion manager, made the arrangements. Three representatives of his department supervised the individual city showings.

Traveling with the show were R. L. Anthony, projectionist, from the Pittsburgh Gateway advertising and sales promotion department; Paul Lord, acting as lighting specialist, from the Beaver Works; Edward Wealton from the Chicago office, who acted as distributor, for part of the tour, and L. M. Walker of the East Pittsburgh Works for the remainder of the tour; and Paul Larson, a professional actor, who appeared as the contractor and several other characters, both in the film and on the stage in person.

First group of meetings began at Salt Lake City, with an attendance of 125, followed by Billings 76, Butte 86, Spokane 74, Seattle 291, Tacoma 91, Portland 219, Eugene 94. A. B. Ferguson made the arrangements for these meetings. R. B. Roberts' meetings at Medford brought 126, Eureka 125, San Jose 197, San Francisco 310, Oakland 222. The figures for the remaining meetings have not yet been received. They continue to Sacramento, Reno, Fresno, Bakersfield and San Bernardino. R. B. Edward had meetings at Los Angeles, Long Beach, San Diego and Phoenix.

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

All in it Together

Winding up a big year in construction the predictions for 1955 continue to be optimistic. The westward migration continues, bringing need for more homes, stores, offices, industries, schools, highways, facilities of all sorts. Despite good volume though, bidding continues highly competitive, with a dozen to 20 or so bidders on every sizable job and prices shaved to the quick. When that happens it is passed on along the line from contractor to wholesalers to manufacturers. Everyone "shares" in it.

Money available

Modernization should make a very sizable business opportunity for electrical contractors and suppliers in 1955. The financing plans to aid in getting such work off the wishing into the action stage are breaking out all over. Banks and financing companies long indifferent to this kind of loan are getting into the act. It took a few dynamic power companies to spark this movement from the banks. Arizona Public Service, Portland General Electric stuck their necks out and now Washington Water Power has a similar plan. Bank of America now advertises home modernization loans. In San Diego the San Diego Federal Savings & Loan is an enthusiastic backer of the Bureau of Home Appliances' Contractors' Division program.

Catching up soon

FHA too is putting emphasis on Title I possibilities. Although it has cut out insurance for dog kennels and swimming pools it is making an effort to aid homeowners to finance any real modernization or improvement and that includes wiring . . . FHA's standards are in process of revision and those for minimum wiring will soon be considered. It is fully expected that the 100-amp service and more circuits will be approved, as recommended by NAHB and the National Adequate Wiring Bureau.

Put it over

By an adroit maneuver the constitution of the National Electrical Contractors Assn. was changed and all of the controversial issues voted down at the convention in New Orleans, Oct. 25-30. At least with this change members will no longer be bothered with a long series of proposed changes every year and rushed into accepting them—it will all be done for them from now on by the board of governors without their vote. Of course the governors can also decide for all members such things as a four-day week, more fringe benefits or anything else IBEW may ask for in the future. It puts more responsibility on the governors and officers. They had better be good ones.

Open the door

Admission of general contractors who do line construction to a new class of associate, nonvoting membership was one of the controversial issues voted. This is done to woo into NECA some of the nation's biggest contractors of line work who do little or no other electrical work and have not been eligible for membership. They do enjoy many advantages NECA contractors do not, though, by not being bound by an IBEW contract. They get IBEW linemen for actual electrical work, wire stringing, but use less costly other crafts for other work, thus underbidding NECA line contractors.

New dues

Dues changes voted include a minimum of $50 a year plus 2/10 of 1% of labor pay roll payable to the national by the chapter. The discount for cash was cut from 5 to 2%. This may require some chapter dues changes where they are low and where there are many small contractors whose dues do not now much more than cover the minimum. There may be less incentive for chapters to seek such membership even for numbers. That was what some of the smaller Western chapters objected to. Reason given is that NECA's extensive services in research, education, apprenticeship, advertising, labor relations, etc., cost more per member than the minimum.

Memorial

Howard G. Dodge saw his job through. Underwriters' Laboratories moved into the new and larger western laboratory and offices at Santa Clara on Nov. 13, a building he had nursed through a multitude of construction difficulties to guarantee it to be an "Underwriters' approved" job it was carefully specified to be. Then the heart he had put into the project, and that had warned

him before, gave out on Nov. 20. Whether so designated by a bronze plate or not that remarkable building will be considered a memorial to a fine engineer and a kind and true gentleman.

Play fair

Ralph Pryne reaffirms Pryne & Co. policy of published quotations and changes available to all distributors simultaneously, in a recent statement. "We do not believe in robbing Peter to pay Paul pricewise," he said. Furnishing salesmen with "unpublished price lists" to be used "where necessary," he maintained, is unfair to good customers who buy regularly because these lists are offered to bait customers the salesman does not have.

More inspection

County electrical inspection will now be done in two more California counties. Santa Barbara County established inspection and employed Glenn H. Marchbanks as inspector. It adopted the PCEA uniform electrical code. Napa County likewise adopted inspection and appointed Joe Mora county inspector. An ordinance to be uniform with that in Napa city is being framed. Two cities recently adopting the PCEA code are Indio and Ojai. This brings to a total of 161 the number of such ordinances—144 cities, 16 counties and one fire district. Los Altos has adopted the same code that Santa Clara County has.

See and be right

Drawings are helping to bring uniform interpretation of code requirements. Utah Chapter of International Association of Electrical Inspectors is considering endorsement by all members of drawings of gasoline station pump installation rules illustrated in a recent IAEI News-Bulletin. In Long Beach SW Section IAEI President Ben Wheater has prepared service entrance equipment drawings which the Southern California Chapter is considering for uniform adoption as it did for previous grounding rules illustrated and now in use by most cities in the area.

Get laws ready

Legislation to be proposed to the new state legislatures in January includes a proposed state electrical law in Utah, a revised law in Washington state to allow charging permit fees and possibly some renewed action in Idaho for similar provisions. In California the Construction Industry Legislative Council has been working on some changes to the subcontractors' listing law covering state work. It would set up something like a state bid depository system to protect subcontractors from bid shopping and peddling. The present law only calls for listing of the subcontractors by a general. Some changes to the mechanics lien law are also to be proposed.

Learn to sell

Luminous diffusing systems (ceilings) have been the subject of more meetings in California. One such meeting was held in Santa Rosa under the sponsorship of the Marin-Napa-Sonoma Counties Chapter of NECA. In San Jose and in Sacramento a joint meeting was held between the NECA chapter and the IES chapter. In San Diego a meeting was held by the San Diego Chapter, NECA. In each a panel of speakers from utility, manufacturers of such systems and NECA describe what the business opportunities are for contractors in the sale and installation of this method of area illumination.

Not all perfect

Some of the problems involved in such systems were presented at the Northern California Section, IES, in San Francisco in November. An architect, engineer, contractor and manufacturer were on the panel. For stores the architect objected to the lack of versatility for making changes to dramatize the store and merchandise. Objection was also raised to the discomfort possible from "acres of brightness" above an office worker's desk. The maintenance problems of changing 8-ft slimlines through a maze of supporting structures for 2-ft modules of plastic were told by the contractor. The manufacturer said he accepted these challenges as part of his responsibility, as well as that of designing so that jurisdiction was included in his product. All agreed the new systems were worth it.

Mourned

With regrets and memories: Paul Brunelle, pioneer electrical contractor and owner of Concord Electric Co. since 1922, aged 66, died Oct. 27 of heart failure. A quiet, kind man, his multitude of friends filled the chapel with flowers in his memory. His sons, Chester and Dick, will carry on the business. Paul Brunelle was claimant to being first to light an outdoor Christmas tree in northern California. . . Crochety Cliff C. McClelland, retired two years ago as electrical engineer, California Division of Industrial Safety, after 10 years, died Nov. 9 while visiting in the East. . . Bill Bracken, agent in Los Angeles for Smithcraft lighting fixtures, died Nov. 18.

Revised code

Los Angeles' city electrical code is to have a public hearing on Dec. 15. Work on revising the ordinance has been going on for more than a year. When started the committees optimistically hoped to get it done in six months and to eliminate enough to cut its bulk in half but as it is being presented it probably contains more than the present one. An ordinance to increase the permit fees was passed in August and went into effect Oct. 16. Permit fees were increased an average of about 18%.

Move south

Kern County and Bakersfield inspectors have asked IAEI to transfer their membership to the Southern California Chapter. They have been in the Central California Chapter out of Fresno but find it easier to attend meetings in the Los Angeles area.

Growth

Among manufacturers' changes are these: Steber Mfg. Co., lighting fixture maker, has established a new West Coast office and assembly plant at 212 S. Anderson St., Los Angeles. Paul Waterbury and John Kresich, formerly of S&M, are sales representatives headquartering there. . . Superior Electric Co. of Bristol has opened a new district sales office to serve northern California at 1245 Junipero Ave., Redwood City, where Marvin Stokem is in charge. . . Panama Lamp Co. is going strictly manufacturers' representative, retaining the Champion Lamp and Supreme Lighting Fixture lines but dropping G-E lamps and residential lighting fixture lines. It has streamlined its forces to fit this new pattern of operation, according to Guy de Leuze, manager. . . Crystalheat Co. has appointed F. Scott Crowhurst Co., Los Angeles, as southern California distributor of its radiant glass heating systems. . . C. D. La Moree, insulating materials representative in Los Angeles, has added a 6,000-sq-ft addition to his space at 1325 San Julian St.

All wave lengths

Leo Kaufmann in San Francisco announces that George W. Gates & Co., which he represents, will soon have a unit which has in it 12 different gaseous tubes employing argon, cadmium, cadmium-mercury, caesium, helium, mercury, neon, potassium, rubidium, sodium, thallium and zinc. It will have a window to transmit the low bands. All lamps will be of equal length, light center length, type of base and operate from one power supply through selector switches. It will sell for around $425 fob New York. Kaufmann, formerly with Keese Engineering Co., now represents G-E lamps, Acme Lighting & Mfg. Co., Ultra-Violet Products Inc., Shannon Luminous Materials Co., Copper-Hewitt Electric Co., at 729 Harrison, San Francisco.

Changes

Among people this news: Joseph R. Ray has been appointed a sales engineer for Fluorescent Fixtures of California to represent the company in Utah, Colorado, Kansas and Missouri. . . Art W. Clark has joined Lou B. Gawan & Associates, consulting electrical engineers of Salt Lake City. He had recently been affiliated with Idaho Falls Electric Co. . . Pete Chambers, who began as district lighting engineer for Southern California Edison, and has been with Westinghouse and Electric Corp., is now with Globe Lighting in Los Angeles. . . R. L. "Buzz" Sawyier now heads the lighting crew for East Bay division, PG and E at Oakland as H. Robison has been given a new assignment of running the dealer representative group. . . At Southern California Edison James Flora, former lighting consultant at Ontario, becomes power consultant at Inglewood and Bill Leylandt succeeds as lighting man at Ontario. Ray Jastrevski is the new lighting consultant at Inglewood, and Jack Wilts at Redondo Beach. . . Robert M. Harris, formerly with Westinghouse and Line Material, is now with the equipment division of Joselyn Pacific Co. . . . Henry A. Klopot from New England is now with Century Lighting in Santa Monica. . . Dave Parker, recently with Columbia Mfg. Co. in Spokane and later Hallek Lighting in San Francisco, has established the D. G. Parker Co. at 1267 Folsom St., San Francisco . . . J. L. Tindale, well known in the West when he represented Anaconda Wire & Cable there, has just been made manager of utility sales for that company.

Air the program

Westinghouse air conditioning division held a two-day sales conference for more than 100 distributors and dealers in the Pacific Coast region at Pasadena, Nov. 16. John A. Gilbreath, division manager, William B. Cott, sales manager, and a group of executives from the Staunton, Va., home of this division came West to tell sales policies, programs and potentials. Frank W. Jordon of San Francisco was host. Products shown include packaged air condition units for residential and commercial use, all-electric heat pumps, Precipitrons.

In copper land

Anaconda is building a new aluminum rod-rolling mill in Great Falls, to be completed early next year. It will be the only both full-fabricating and semi-fabricating unit in the Anaconda Wire & Cable Co. group. Automatic operation of rod-rolling and wire drawing and stranding of the latest design will be installed.

More red

Sylvania Electric Products says it now has a "super de luxe cool white" fluorescent lamp with better color balance than the de luxe. Also announces that all its lamps will have welded base pins instead of soldered or crimped pins to give better metal contact, starting with rapid-start lamps.

New heater

Electromode has added a baseboard electric heater to its line. It gives low level perimeter heating with either a wall mounted or line voltage thermostat. Use is made of the same cast aluminum heating elements embedding the wiring within the finned castings. Basic unit is 32 in. long, 8½ in. high, 3 in. wide with 600-w capacity for either 110- or 210-v operation.

Sales helps

Helpful booklets available just announced: Kennecott Copper Corp., which has been doing an attention getting cartoon ad campaign in consumer publications on adequate wiring, offers a new cartoon illustrated booklet, "The ABC of Home Wiring," that contractors can give to their customers without charge for up to 50 copies. It should aid in selling up to a really good wiring job. . . Wiremold has a new catalog, "Wiremold Fluorescent Lighting Fixtures and Fittings," describing the four series of units available and applications for them. . . Kaiser Aluminum & Chemical Sales makes available if requested on a company letterhead a $2 book free to contractors and utilities, titled, "Kaiser Aluminum Electrical Conductor Technical Manual." It provides data on properties, electrical characteristics, applications and calculations needed in designing electrical distribution with aluminum conductors. . . Sylvania offers an office lighting book, "Good Lighting Is Good Business," and for sign men a book of 24 complete sign blueprints by designer George F. Myers, the third such volume it has produced. . . Ray J. Noel Co., Los Angeles, representing Advance Transformer Co., offers the latter's latest ballast brochure containing data on circuits, construction, wiring and testing.

Caution public

To warn the "Do-it-yourselfers" Chester Hefner, San Mateo county inspector, coined a slogan that Local 617, IBEW, printed up as a window card used to advertise National Electrical Week. It is one that should be told to the public whenever possible. "Wiring is not a hobby—Have it done by professionals."

Background

Maybe you've heard—That Pyle-National Co., maker of electrical fittings, equipment and air conditioners, has bought all patents for Multi-Vent and Acousti-Vent from Burgess-Manning Co. . . And that ITTC has licensed G-E Co. to use its patents for radio telephone, pictures, radar and radio control for civilian use. . . And that Duro-Test Corp., maker of lamps, has acquired 10 basic patents relating to mercury vapor lamps from Michel E. Macksoud.

Through the smog?

Southern Pacific Co. is trying out television in a freight yard in Los Angeles to watch the freight car movements and general switching operations over a large area. Equipment consists of a viewer on the terminal superintendent's desk and two cameras, one with wide angle lens, the other a telephoto lens, mounted on a 60-ft tower. If successful SP may put in more to watch a two-mile-long yard.

New title

Beginning Jan. 1 William A. Cyr, who, among others, edits these pages, becomes a consulting editor for Electrical West instead of associate editor. He will continue to edit this contractors' news letter as well as contractor, inspector and lighting and wiring features and news.

And new office

Biddle Trade Bureau will establish a San Francisco office at 68 Post St. and will be represented in northern California, northern Nevada and Utah and southern Idaho by Bill Cyr as consultant. Biddle Trade Bureau, management consultants and publishers of electrical contractors retail and electrical wholesalers pricing services, headquarters in Los Angeles. Northwest representative is A. T. Hutchinson. Biddle Trade Bureau just recently bought the A. E. Rowe pricing book of San Francisco and is continuing it with service from its Los Angeles plant. A. H. Gudie, whose article appears on p 59, is president of BTB.

McNab Liecty

Beckett Dreiman

Kimball Sherwin

Joint Group Starts Treasure Hunt for Net

PCEA-PCGA section searches out ways to hold down costs through increased efficiency

Built around the timely theme, "Treasure Hunt for Net," a search for greater efficiency was put on by the Pacific Coast Electrical Assn.'s Administrative Services Section and the Pacific Coast Gas Assn.'s Accounting Section for their fall conference in San Francisco on November 18 and 19. Registration for the two-day session was 172.

James T. McNab and John L. Liecty, Arizona Public Service Co., were joint chairmen of the conference, in which four sections participated—credit and collection, building maintenance, pay roll accounting and stores. The other four will meet on April 7 and 8 in Phoenix. This group also has scheduled a special two-day seminar on processing with electronic machines for Feb. 23 and 24 in Los Angeles.

Vice-chairman of the joint program is F. W. Mielke Jr., Pacific Gas and Electric Co.

Following custom, the group met in parallel sessions for discussion, gathering at lunch to hear industry speakers. Need for devising more efficient systems in face of rising costs and for getting their acceptance was brought out at luncheon on Thursday by Roy N. Dreiman, PCEA president, and on Friday by E. D. Sherwin, PCGA president.

"The industry enjoys unparalleled investor confidence. The market is international in scope."

Financing a Utility

While in theory financing a public utility is relatively simple, it is a trick to raise all the money needed at the proper cost, John R. Beckett, Blyth & Co., San Francisco, pointed out at the Thursday luncheon. As the son of Ernest Beckett, former PG and E treasurer, and an investment man working on utility securities, he had a kinship with his audience and a thorough knowledge of his subject.

Most utilities are relatively simple to finance, he said, because the industry enjoys unparalleled investor confidence and companies can be compared on the basis of price.

Utilities are raising considerable amounts of new money and will continue to do so for a number of years, he said, adding that in his opinion, to protect the stockholder and the public, they should endeavor to raise common stock money at as high a premium over book value as is reasonable, with due regard to the fact that new stockholders are pleased to see shares go up rather than down in value.

The problem as he sees it is to keep capitalization ratios in proper balance to protect the interest of common stockholders and the company's credit; to maintain earnings that will service the capitalization (if necessary file for rate increases); to maintain investor confidence mainly by operating performance and secondarily by a program for dealer and investor relations; to offer the proper security to raise new money; to share with the common stockholders some of the fruits of growth by increasing dividends from time to time.

Outlining the steps in a typical utility transaction and showing the volume of paper work involved, he emphasized the importance of speed and accuracy. Markets change, not always for the better, he reminded the group. From 24 to 40 days are required on paper work, he said.

Touching on the banker relationship, which he said is so little understood and of which politicians have made a political football, he described the investment banker as much like the corporate attorney or the family doctor. "We are not dealing in nuts and bolts, bricks and mortar . . . We deal in mutual confidence; in performing an outstanding service; in accomplishing a job as instructed by our principal, and in all those things that make up a service type of business relationship as contrasted to a construction type where one puts together a certain amount of brick and mortar on a job secured by a competitive bid."

Better Farming?

Pointing to the accomplishments and contributions of the industry in 75 years, John T. Kimball, vice-president and general manager, Idaho Power Co., brought out some of the things

"We are not dealing in nuts and bolts, bricks and mortar . . . We deal in mutual confidence . . ."

"It is time to check the areas in which savings can be made . . . Aggressive selling is pushing net curve down."

that need to be done under today's conditions to maintain service at the price people can afford to pay. His down-to-earth talk, given at the Friday luncheon, commended the hunt for net through more efficient operation; pointed up the importance of doing "something about it when you get back to the office."

Savings the financial people have been able to make have contributed greatly in keeping rates down, he said, but they have been about played out and there is not much more to be done by refunding bonds. The challenge for the future and immediate days ahead is to find ways and means to farm better; to give acceptable service at the price the customer is willing to pay and still return a profit, he declared.

Pointing out that types of service are being met not 100% but 1,000% and that it is the overdoing that costs money, he said it was time to check the areas in which savings can be made. The objective, he stated, is to meet service requirements of a particular customer or class of customers and do it in as efficient a way as possible. Aggressive selling is pushing net curve down.

Kimball believes that the utility staff needs a hard-headed person to concern himself with finding the weak spots in operation and needling until someone does something to correct them. (Areas that he might search are discussed in Kimball's article, Expense Control Is the Answer (EWEST, November, p 73). Can we afford the type of operation we have now, he asked. It's imagination that is at a premium.

Objectives should be known to employees and public, he advised. A utility should be willing to get out in front in research; to search for and accept change if it will work out for company, employees, customers and stockholders, he said.

Give the employees a fair shake and let them know you are, he advised. The job depends on the employee. There must be communication from the top down, he declared.

He suggested a functional organization, with responsibility and authority going hand in hand. There is need of a continuous evaluation by measuring rods people can understand and will accept, he said.

Survival in private enterprise means giving a better product at what the people can afford to pay, he warned in conclusion. The human element will be the same.

Building Maintenance

R. I. Meyerholz, PG and E
Sponsor

Stating that present practice of PG and E is to build for relative permanence, Meyerholz outlined the maintenance system initiated by the company for its buildings, which include many categories. A building inspector from the operating department makes inspection trips into the company's various divisions, listing each building and recommending necessary repairs. This information is entered on a card for each building. After repairs have been made, they are described in detail on the card, giving cost of the work, date completed and materials used. This record is kept so that when the next inspection is made the materials used in the previous repair job can be checked for durability.

The work is done either by company crews or outside contractors, depending upon the size of the job. Specifications are prepared for the major repair jobs and competitive bids are obtained; the work is then contracted out. Materials and type of construction are specified to keep cost within reasonable limits and assure a low future maintenance cost. The work is supervised by the company's building inspector to ensure that specifications are carried out in detail.

With a systematic building maintenance program, life of structures can be extended well beyond normal life expectation, it was pointed out.

Reinforced Concrete Buildings

M. D. Gustafson, PG and E, spoke on maintenance of reinforced concrete buildings. He said it is very important that reinforcing steel be placed with proper cover so that it will not corrode and cause the concrete to spall or crack by moisture entering the walls. Another factor is to clean out all foreign material from between the forms before pouring the concrete so that a path will not be provided to cause leaking.

In repairing a concrete structure the damaged area is cut out first to expose the steel. This is followed by sandblasting of the concrete and rusted steel. The steel is then primed with red lead to retard further rusting and followed by plastering of the removed area. The next operation is the sealing of major cracks in the concrete, which is accomplished by cutting the crack to a V- or U-shape groove about 1½ in. wide and about the same depth. The bottom of the groove is then shellacked and a bead of mastic placed over the crack in the bottom of the groove. The remainder of the groove is filled with expanding cement mortar and finished off flush with the wall. After the repairs to the concrete have been made, the entire surface is given a coat of waterproofing material. Waterproofing materials of a cementitious nature or of the plastic type such as Dum Dum or Guntex are recommended.

At the conclusion of this talk, the group was taken by bus to Emeryville to examine a concrete building under repair.

Termites

Frank Edson of Arizona Public Service disclosed that termites preceded the human race. There are approximately 2,000 known species in the world, but only about 50 or 60 species are found in this country.

Conditions have to be right for termites, he said. Most types cannot exist without moisture. They require cellulose for food in the form of wood, linoleum, linseed oil, dextrose, etc. One of the most effective ways to prevent termite infestation is to remove all form lumber from the foundation walls of a newly constructed structure, provide proper ventilation to eliminate possible moisture and treat the ground with Paradichloral or other proved extermination medium. Various exterminating chemicals in the market today were discussed.

Unit Costs

The subject of building maintenance unit costs was presented by J. T. Cor-

"Survival in private enterprise means giving a better product at what the people can afford to pay."

Cunningham Mielke

Meyerholz Fairlee

Parsley Connors

telyou, So. Calif. Gas, whose committee is now making a study of building maintenance unit costs.

"With a systematic building maintenance program, life of structures can be extended well beyond normal life expectation."

Old and New Paint

Interior and exterior painting was discussed. Both old and new paints were discussed with methods of application. H. E. Thomas, PG and E, told of the advancement made by paint manufacturers in recent years. The company tests its paints in three or four areas with different climatic conditions in order to determine the proper paint to use for each area to provide the longest lasting and most economical protection. All types of paints were discussed, including synthetic, oil base, rubber base, automobile paint, zinc and iron oxide primers, silicones, etc.

Arthur Mitchell, district manager, asphalt department, Pioneer-Flintkote, discussed new roofing maintenance trends. One of the recent materials developed is fiber glass and the other is static asphalt. The two products are used together for certain waterproofing applications. Since 1951 this company has been selling static asphalt emulsion. This product is said to have many fine points and its advantages were described in detail.

Pay Roll Accounting

R. R. Connors and R. E. Parsley, San Diego G&E Joint Sponsors

Because the companies have much in common in requirements of this operation but use greatly varied methods according to size, union contracts, types of pay roll systems, etc., the discussion concentrated on methods. With 28 delegates representing seven companies, round-table discussion touched on almost every phase.

Paul Boyington, So. Calif. Ed., led the discussion on responsibility of timekeeper or local supervisor; reporting of time worked, unproductive time and responsibility of proper distribution. The majority agreed that responsibility for correctness of time worked and distribution belongs to the timekeeper or local supervisor.

Employee Records

Employee pay roll records were discussed under leadership of Richard R. West, So. Counties Gas, including those required for change, control of allowances, earnings, check register, termination pay and those necessitated by regulation regarding withholding on sickness payments. It was brought out in discussing the latter that most of the companies are not making any change for the year 1954 but are notifying employees about the new regulations and assisting them in making any claims for refunds. Most companies are undecided on procedure for 1955 but probably will continue to withhold.

A detailed discussion on miscellaneous pay roll deduction was led by C. G. Scheel, So. Calif. Gas, with methods of keeping controls and records of the various deductions getting a good deal of attention.

Wage Controls

Wage controls maintained by the pay roll department were discussed under leadership of Owen Ruddy, Seattle Gas, who also reviewed some of the previous discussion.

Mechanized Equipment

Since five of the companies represented use mechanized equipment in pay roll accounting, it came in for a good deal of discussion. Consensus seemed to indicate definite advantages to be obtained with these machines provided they are used full time.

Credit and Collections

J. A. Cunningham, So. Calif. Gas Sponsor

Eight discussion leaders conducted the sessions in this group, which drew an attendance of 45. They were: J. A. Lopez, Pacific Tel. & Tel.; G. H. Larsen, So. Calif. Ed.; C. T. Dickson, Arizona Public Service; K. L. Boosey, PG and E; A. E. Press, Utah Power & Light; R. A. Gormsen, So. Calif. Gas; B. F. McManus, Mutual Credit Bureau; E. F. Beatie, So. Calif. Gas.

The program led off with a discussion by Pacific Telephone & Telegraph Co. on selection and training of service representatives. One girl handles all phases of customer account, sales, service and collection for about 2,500 accounts. Recordings of typical telephone conversations with customers showed how to discuss delinquent accounts, explain service policies and billing methods, accept a new service request.

A Bimonthly Plan

A representative of a large electric company described a collection procedure in operation in his district for the past three years. All bills are on a bimonthly basis. On the company's normal schedule a reminder notice is sent 25 days after presentation of the bill, with subsequent notices and field calls scheduled to complete collection before reading for a four-month bill

"Decentralized collection procedure benefits public relations by eliminating head office ultimatums."

would occur. Under this plan, notices are omitted during a full bimonthly cycle, then a reminder sticker is attached to the new bill if the previous bimonthly bill remains unpaid. Ten calendar days later a five-day notice is mailed. At this point an effort is made to collect the bill in full. If the customer develops a habit of not paying until a four-month bill has accrued, collection is placed on the regular bimonthly basis. In this district of 67,000 meters a saving in mailing of 277,000 notices has been made in three years, it was reported. It was noted also that bad debt writeoff for the entire system went up .080% in the three-year period; that of this district, .036%.

Collection at Local Level

Another utility representative showed how collection procedures have been set up in outlying offices. This activity is carried on at the local level, where people familiar with the type of community and close to the customer's problems are best able to handle it. When the customer is turned on, he is coded and as his payment record develops, coding is altered. At the time notices are due, certain coded accounts are reviewed by the local manager, who determines which may be handled by telephone or personal contact rather than mailed notices. It is felt that this decentralized system benefits public relations and keeps local managers aware of circumstances involving their customers. In a widely scattered area, elimination of contacts between the local office and main office saves time and telephone expense.

Packaged vs Personal Reminders

Advantages and disadvantages of mailing package notices and personal letters were debated in a discussion of collecting closing bills. Chief advantage of the package notice is that it can be prepared mechanically and is economical; disadvantages are cheap paper, impersonality and waste when payment makes follow-up forms unnecessary. Personal letters have the advantage of conveying to the customer that he is getting special attention. The conference agreed, however, that they are too expensive except for larger bills. With one exception, all utilities represented use outside collection agencies to collect closing bills, though most wait until they have made every reasonable collection effort. Use of the small claims court to collect closing bills was also suggested.

One company is using this court for amounts over $25 after the collection supervisor has satisfied himself that payment can be enforced after judgment is secured. The majority, however, seemed to feel that red tape involved is considerable and that publication of legal action hurts the utility.

Discussing training programs for credit and collection employees, it was pointed out by one representative that, until a formal written program was undertaken for presentation to all credit and collection people throughout his company, many of the management staff could not give a clear statement of policy. The written material includes manuals with cartoon-type illustrations; color slides with synchronized sound to show collection techniques. The training program is given to all credit and collection department employees.

Claims Department

Functions of a claims department in determining liability in billing and collecting claims for damages to company property were explained. Importance of complete and immediate reporting by operating people of all available facts was stressed. Securing of witnesses was also declared important.

Many claims arise from damage to services and mains during construction. In these cases investigation is necessary to determine responsibility. One company has developed a streamlined type of billing which can be presented within five days after the repair has been made. It is based on a flat rate per man-hour required to make the necessary repairs, averaged to cover overtime and to include overheads, mileage, tool expense, etc. This type of billing is well accepted generally, it was reported. Where resistance is met, the utility should be able to prove its case by preponderance of evidence.

It was emphasized at the outset of the discussion that the other party, who in most instances is a customer, should be invited to discuss his side of the story.

Collection Agencies

Collection agency activity was covered by a representative of a privately owned credit bureau. He stated that in a large city there are few agencies that do a good combined job of credit reporting and collecting; said that the best bet is to use an agency that specializes in collecting. In the smaller communities if the credit bureau has an aggressive collection agency, this is the best type of service to use, it was advised. Early transfer of a closing bill to a collection agency improves the chance of collection, the agency representative said.

Considering the topic of sharpshooting to reduce losses, one company representative explained a statistical method of watching for trends by area within a large metropolitan district. Through tabulating billing statistics it is possible to relate the amount of uncollectibles within a geographical area to the total amount of closing bills exposed to risk in that area over a given period of time, it was pointed out. By keeping statistics up to date, trends are established. In the collection follow up schedule, the manpower effort should then be concentrated in those areas that show the highest relative loss. This effort is directed primarily to keeping arrears down so that the exposure to loss will be minimized when accounts close. It was suggested that, once a customer has indicated a poor payment trend, adequate deposits be secured.

Stores

W. N. Fairlee, PG and E
Sponsor

Standardization of pipe lengths used by public utilities was discussed in detail by both utility and manufacturers' representatives, with benefits to both enumerated. Uniform lengths result in simplified inventory, easier storage, less damage to wrapped pipe and elimination of handling equipment, it was brought out.

Manufacture of pipe from mining of the ore to the finished product was depicted in a film shown to the group. At its conclusion, manufacturers' agents pointed out the difficulty in obtaining uniform lengths and still maintaining the quality control demanded by utilities. Consensus was that there is a possibility of obtaining 85% of all pipe in uniform lengths if the utilities will undertake to purchase the remaining 15% in random lengths.

Materials Handling

Discussing materials handling methods and equipment, the group was

given a plan for the most efficient warehouse layout. Standard packing was taken up in detail as a means of cutting labor costs in handling. It was pointed out that much has been done by the manufacturers toward standardizing packages but there is still considerable to be accomplished in this field.

One item of interest brought out by this discussion was that standard-size pallets have not been adopted throughout the industry. Suggestion was voiced that, if this could be done, pallet exchange could be established, eliminating rehandling of shipments.

Other subjects presented were types of materials handling equipment now available, their use and adaptability to various operations.

Personnel

Indoctrination of new employees, excessive sick leave and labor turnover were main points of interest in a discussion of personnel.

Material Control

Handling of distribution transformers was the first subject treated under the general subject of material control. It was believed generally that control of transformer orders should be originated and maintained by the operating departments since they are more able to forecast needs. Various methods of control after receipt were discussed and some representatives seemed to feel that present systems were too cumbersome.

Scrapping or Rebuilding

As to scrapping or rebuilding, consensus was that study should be made of each individual transformer. If rebuilding was decided upon, another study should be made to determine whether recoring or rewinding was the more economical method. The majority attending the conference believed rewinding to be more economical.

Stock and Inventory

Moving on from distribution transformers, the group took up stock and inventory control. It was pointed out that the establishment of a stock control section in most cases was an economical and essential operation. Function would be to check all orders, draw from surplus stocks wherever available, check quantities ordered in keeping with basic needs, hold stocks to minimum commensurate with use.

Question of purchasing locally was discussed, with most representatives feeling that this prerogative should not be given to outlying districts; that a central control should be maintained. It was brought out that one utility ships direct from vendor to outlying substores; handles only emergency materials through its central storeroom.

Obsolete Material

Continuing the discussion of inventory control, control of inactive, surplus and obsolete materials was studied. It was agreed that emergency materials are essential to operation but should be kept to a minimum. However, it was pointed out that this decision rests not with the stores group but with operating people; that close cooperation between the two is all important in maintaining adequate emergency stock and keeping investment to a minimum.

Surplus and obsolete materials were defined as those generally in excess of 12 months' use that had been superseded by more modern and efficient items. A continual review must be made of this type of material, based on some definite established company policy, it was decided. Once an item has been classified as surplus or obsolete, the disposal of such an item should be determined on an economical basis. The Bruce Henderson Formula is being used by several companies.

Forfeit of Deposits

Discussion of loss due to demurrage on cylinders and forfeit of deposits on drums and reels brought forth the fact that local delivery and pickup of oxygen and acetylene was having a very definite effect in reducing demurrage as against handling this material through a centralized point. One company indicated a saving of upward of $2,500 a year through the adoption of this method.

Elimination of forfeiting deposits on drums and reels brought forth very little in the way of constructive ideas inasmuch as none of the companies present was able to advance any sound solution to emptying reels and returning them prior to the expiration date of the deposit forfeiture. The opinion of the group was that to empty the reel by re-reeling the cable would be more expensive than forfeiting the deposit.

NECA

Santa Clara-San Benito Chapter, National Electrical Contractors Assn., shifted its usual meeting from Nov. 8 to Nov. 17 to meet jointly with the Illuminating Engineering Society for a discussion of luminous area lighting. Speakers were John Walsh, PG and E, Ted Bakeman, Wakefield, John Keyes, Benjamin, Fred Benz, Smithcraft, Bill Sears, Sylvania, and Guy Cummings, All-Bright. Representatives of the AIA, IBEW and local engineers in the area also attended.

Rocky Mountain Chapter, NECA, met Nov. 8 at the Denver Press Club for its annual committee organization meeting. Its annual Christmas party at the Beacon Club is set for Dec. 13.

EMEA

Electrical Maintenance Engineers of Southern California held old-timers night Nov. 17, followed by a fellowship smoker Nov. 19. Paul Tomlinson, Pacific Telephone & Telegraph Co., presented and demonstrated long distance dialing, spoken word dialing, etc.

AIEE

In December the San Francisco Section heard a discussion by Dr. Harry K. Ihrig, vice-president in charge of research of the Allis-Chalmers Mfg. Co., on the Romance of Metals. Ihrig discussed the more interesting histories, properties and uses of metals and the science of refining and fabricating metals. The newer metals such as aluminum, magnesium, titanium, as well as new synthetic metals, also were covered by Ihrig.

"Building a Technical Team" was the subject of the second management meeting, Los Angeles Section. C. T. Reibold, Pacific Telephone & Telegraph, was speaker.

EEI

O. Rodney Doerr, vice-president in charge of sales for Pacific Gas and Electric Co., was named chairman of the Commercial Division General Committee of Edison Electric Institute. He replaced Streuby L. Drumm, West Penn Power Co., who resigned.

Power Dispatchers

American Power Dispatchers Assn. Inc. held its recent semiannual meeting in Los Angeles. National officers are at present elected from the southwest area membership. National president is R. W. Mort, Southern California Edison Co. Vice-president is D. P. Bengtsson, L. A. Department of Water & Power, and secretary-treasurer is R. F. Davis, Southern California Edison Co. Southwest area officers are: chairman, E. V. Giddings, Burbank Public Service Department; secretary-treasurer, E. E. Todd, L. A. Department of Water & Power; director of publicity, C. H. Camp, San Diego Gas & Electric Co.

PANORAMA OF THE PCEA.

Chairman E. W. Meise of PCEA's residential adequate wiring committee reports that the committee held its initial meeting in Los Angeles on Nov. 10. At the meeting the purpose of the committee was defined as being to organize and establish a wiring promotional program that the entire industry could support and in which all segments of the industry could participate. To achieve that objective the committee set up the following steps which it will attempt to undertake this year. They are:

1. To sell local offices of the Veterans' Administration and FHA on the voluntary standards for residential wiring as recently adopted by the National Association of Home Builders.
2. To sell loaning institutions on the value of adequate wiring and rewiring.
3. To meet with appraisers' associations and help them establish definite methods of appraising the loan value of wiring.
4. To meet with local chapters of the National Association of Home Builders to obtain their full support of their own association's wiring program, and to inform them of steps to be taken in applying for loans to cover increased wiring.
5. To demonstrate the value of the adequate wiring program to contractors and to interest them in participating in it.
6. To establish an adequate wiring tie-in with all other residential committees of the PCEA.

PCEA Committee Roster

The names of PCEA committee chairmen for this year have been published, but following is a roster of all PCEA committees so far established as of this writing for 1954-55. A few additional appointments remain to be made.

President's Advisory Committee—R. N. Dreiman, PG and E, San Francisco, president, advisory; V. W. Hartley, managing director, PCEA, Los Angeles, advisory; J. T. McNab, Arizona PS, Phoenix, chairman, Administrative Services Section; F. W. Mielke Jr., PG and E, San Francisco, vice-chairman, Adm. Ser. Sec.; J. A. Corlett, G-E, San Francisco, chairman, Business Development Section; J. H. Adams, So. Calif. Ed., Los Angeles, vice-chairman, Bus. Dev. Sec.; W. T. Johnson, Cal. Elec. Power, chairman, Engineering & Operating Section; F. E. Bodine, Westinghouse, San Francisco, vice-chairman, Eng. & Opg. Sec.

Administrative Services Section

Guidance Committee — J. T. McNab, Arizona PS, Phoenix, chairman; F. W. Mielke Jr., PG and E, San Francisco, vice-chairman.

Planning and Coordinating Committee —J. T. McNab; F. W. Mielke Jr.; George Coughlan, PG and E, San Francisco; H. L. Moore, So. Calif. Ed.; R. I. Meyerholz, PG and E, San Francisco; E. R. Peterson, So. Calif. Ed.; F. U. Naylor, PG and E, San Francisco; William De Waard, San Diego G&E, San Diego; Dexter Stoner, PG and E, San Francisco.

Contract Procedure—(Joint with PCGA, sponsored by PCEA) E. V. Noe, PG and E, San Francisco, chairman.

NARUC Committee—(Joint with PCGA, sponsored by PCGA) E. N. Simmons, So. Calif. Gas, Los Angeles, chairman.

Seminar on Electronic Data Processing —Dexter Stoner, PG and E, San Francisco, Earl R. Peterson, So. Calif. Ed., Los Angeles, joint sponsors.

Business Development Section

Guidance Committee — J. A. Corlett, G-E, San Francisco, chairman; J. H. Adams, So. Calif. Ed., Los Angeles, vice-chairman; A. A. Reitman, G-E Lamp Div., Los Angeles; Christine Dent, Westinghouse, San Francisco; E. W. Meise, San Diego G&E; H. G. Atwater, L. J. Meyberg Co., San Francisco; C. V. Soper, So. Calif. Ed., Los Angeles; G. H. Sullivan, So. Calif. Ed., Los Angeles; Robert Thunen, Sylvania Electric Products, Oakland; D. V. Doub, PG and E, San Francisco; W. F. Lambirth, Calif. Elec. Power, Riverside; Jack Kiedaisch, Arizona PS, Phoenix; C. D. Bronson, Calif. Electric, Oakland; D. F. Roach, Westinghouse, San Francisco; George Larsen, Larsen-Hogue Electric, Los Angeles; J. S. C. Ross, PG and E, San Francisco; P. L. Mullenbach, BullDog Electric Products, Los Angeles.

Agricultural Load Building Committee —G. H. Sullivan, So. Calif. Ed., Los Angeles, chairman; D. F. Roach, Westinghouse, San Francisco, vice-chairman; R. R. Whittaker, Calif. Elec. Power, Riverside; Don W. Struck, San Diego G&E; T. W. Christensen, PG and E, San Francisco; J. C. Porter, G-E, San Francisco; J. A. Longley, Allis-Chalmers Mfg., San Francisco; D. G. Hartman, Westinghouse, Fresno; James Lyon, Lyon Rural Electric, San Diego.

Code and Ordinance Committee—L. P. Shelley, Federal Pacific Electric, Los Angeles, chairman; W. H. Abraham, PG and E, San Francisco, vice-chairman; F. N. Strauss, G-E, Oakland; M. K. Bliss, Pacific Fire Rating Bureau, San Francisco; C. A. Dahl, G-E Supply, San Francisco; E. J. Weber, Emil J. Weber Electric, San Francisco; P. F. Wilson, electrical inspector, Santa Rosa; E. G. Kramm, NECA, Oakland; Lyle D. Barter, Westinghouse, San Francisco; E. L. Nelson, chief electrical inspector, San Leandro; R. E. Arbogast, Newbery Electric, Los Angeles; C. Croft, Square D, Los Angeles; E. S. Dibble, G-E, Los Angeles; S. J. Johnson, Acme Steel, Los Angeles; L. E. La Fehr, electrical inspector, Alhambra; P. L. Mullenbach, BullDog, Los Angeles; R. J. Walker, Westinghouse, Los Angeles; G. F. Wismer, electrical inspector, Santa Monica; A. C. Veit, electrical inspector, Los Angeles; J. H. Adams, So. Calif. Ed., Los Angeles; Les Waggoner, Arizona PS, Phoenix; Floyd B. Breedlove, San Diego G&E.

Commercial - Industrial Lighting Committee — Robert Thunen, Sylvania, Oakland, chairman; J. Roy Jones, Westinghouse Lamp Div., Los Angeles, vice-chairman; Al Williamson, Arizona PS, Phoenix; W. J. Herz, Sierra Pacific Power, Reno; C. W. Thompson, San Diego G&E; F. J. Rohring, So. Calif. Ed., Los Angeles; J. S. Walsh, PG and E, San Francisco; John Keyes, Benjamin Electric Mfg., San Francisco; Arthur Dahl, G-E Supply, San Francisco; J. L. Scritsmier, Sylvania, Los Angeles; Bob Ford, Smoot-Holman, Inglewood; Ed E. Coleman, G-E Lamp Div., Los Angeles.

Commercial-Industrial Wiring Committee—Paul L. Mullenbach, BullDog, Los Angeles, chairman; C. D. Bronson, Calif. Elec., Oakland, vice-chairman; Al Williamson, Arizona PS, Phoenix; W. J. Herz, Sierra Pacific Power, Reno; L. D. Dame, So. Calif. Ed., Los Angeles; F. B. Dickey, Anaconda Wire & Cable, San Francisco; Carl O. Martin, Benjamin Elec., San Francisco; Martin Noack, Orangeburg Mfg., San Francisco; William R. Major Jr., Crouse-Hinds, San Francisco; L. Roy Moser, San Francisco; Roy Stanley, Div. of Industrial Safety, San Francisco; L. G. Jeffrey, Jeffrey Elec. Construction, Fresno; Garth Chamblin, Calif. Elec. Construction, San Francisco; H. D. Easterbrook, H. D. Easterbrook Co., Los Angeles; William Summers, Jeffries Transformer, Los Angeles; R. E. Stone, National Elec. Prod., Los Angeles; W. M. McKenney, Phelps Dodge Copper Prod., Los Angeles; Charles Croft, Square D, Los Angeles; John T. Stetson, Stetson Elec., Los Angeles; R. E. Larsen, Triangle Conduit & Cable, Los Angeles; A. W. Tracy, Anaconda Wire & Cable, Los Angeles; W. S. Warren, Rome Cable, Los Angeles.

4-H Club Electricity Project Committee —Thor W. Christensen, PG and E, San Francisco, chairman; D. L. Turner, San Diego G&E; G. H. Sullivan, So. Calif. Ed., Los Angeles; R. R. Whittaker, Calif. Elec. Power, Riverside; W. C. Winghamer, Westinghouse, San Francisco; W. L. Winter, Westinghouse, San Francisco.

Highway Lighting Committee — H. F. Hartzell, Maydwell & Hartzell, San Francisco, chairman; O. R. Doerr, PG and E, San Francisco; H. G. Dillin, San Diego G&E; G. N. Hawley, So. Calif. Ed., Los Angeles.

Technical Subcommittee of Highway Lighting Committee—G. A. Trosper, PG and E, San Francisco, chairman; J. H. Burson, Westinghouse, San Francisco; R. E. Dahlin, So. Calif. Ed., Los Angeles; J. E. Hammond, PG and E, Fresno; K. M. Koch,

G-E, San Francisco; B. V. Kunde, Line Material, Los Angeles; L. W. Luley, Westinghouse, Los Angeles; E. L. Ralston, Hawaiian Elec., Honolulu; H. W. Ritter, Calif. Elec. Power, Riverside; L. W. Towner, G-E, Los Angeles; G. S. Kimball, San Diego G&E.

Home Economics Committee—Christine Dent, Westinghouse, San Francisco, chairman; Ruth D. Kruger, Arizona PS, Phoenix, vice-chairman; Marjorie C. Helm, Calif. Elec. Power, Riverside; Mary K. Burton, San Diego G&E; Lois S. Cline, Frigidaire Sales, Los Angeles; Sina B. Moore, G-E Appliance, Los Angeles; Dorothy Huse, Sues, Young & Brown, Los Angeles; Lorene Craft, Westinghouse Supply, Los Angeles; Pauline Eliker, So. Calif. Ed., Los Angeles; Evelyn Conant, So. Calif. Ed., Santa Monica; Helen Randol, Westinghouse Supply, San Francisco; Marjorie Harper, G-E, San Francisco; Phyllis Larson, Avco, Crosley Div., San Francisco; Mary J. Kelley, Philco, San Francisco; Betty Smith, Frigidaire, Oakland; Ann Cook, International Harvester, Oakland; Clara Sherbourn, Hotpoint, San Francisco; Erma Meeks Boyen, Hawaiian Elec., Honolulu; Marguerite Fenner, PG and E, San Francisco.

Home Lighting Committee—A. A. Reitman, G-E Lamp Div., Los Angeles, chairman; Guy de Leuze, Panama Lamp, San Francisco, vice-chairman; Les Waggoner, Arizona PS, Phoenix; R. B. Borland, Westinghouse, Los Angeles; W. J. Herz, Sierra Pacific Power, Reno; Roy E. Bevan, Sylvania, Los Angeles; E. M. Tallon, So. Calif. Ed., Los Angeles; W. E. Lind, PG and E, San Francisco; Maxwell Rosen, Incandescent Supply, Los Angeles; Martin J. O'Conner, PG and E, San Francisco; W. E. Carlson, G-E Lamp Div., Oakland; M. H. Jankelson, Incandescent Supply, San Francisco; C. R. Long, Westinghouse, San Francisco; William Chapman, Sylvania, San Francisco.

Kitchen and Laundry Committee—Herbert G. Atwater, Leo J. Meyberg Co., San Francisco, chairman; M. A. Hoff, Hotpoint, Los Angeles; Ralph H. Munson, Calif. Elec. Power, Riverside; E. W. Meise, San Diego G&E; R. M. Smith, So. Calif. Ed., Santa Ana; Daniel Alexander, PG and E, San Francisco.

Residential Adequate Wiring Committee—E. W. Meise, San Diego G&E, chairman; W. H. Abraham, PG and E, San Francisco, vice-chairman; John R. McNeese, Calif. Elec. Power, Riverside; Les Waggoner, Arizona PS, Phoenix; Harry Allen, So. Nev. Power, Las Vegas; L. N. Bjerrum, So. Calif. Ed., Los Angeles; Charles F. Parks, Graybar Electric, Los Angeles; W. M. McKenney, Phelps Dodge, Los Angeles; Karl G. Kempf, Thomas & Betts, Los Angeles; A. M. McMillan, Harvey Hubbell, Los Angeles; R. J. Walker, Westinghouse, Los Angeles; G. F. Wismer, electrical inspector, Santa Monica; E. E. Karsten, Gough Industries, Los Angeles; L. G. Maechtlen, Square D, Los Angeles; L. P. Shelley, Federal Pacific, Los Angeles; J. Clyle Soden, Soden Wholesale Elec., Riverside; C. H. Thrane, G-E Supply, Los Angeles; A. B. Smedley, Pasadena; W. R. Rivers, G-E, Los Angeles; W. H. Johnson, Fidelity Elec., Los Angeles.

Room Cooler and Heat Pump Committee—C. V. Soper, So. Calif. Ed., Los Angeles, chairman; N. W. Clingman, PG and E, Stockton, vice-chairman; C. E. Kiefer, Calif. Elec. Power, Riverside; E. W. Meise, San Diego G&E; Harry Allen, So. Nev. Power, Las Vegas; Frank W. Jordan, Westinghouse, San Francisco; J. W. Houghton, Westinghouse, Los Angeles; D. J. Slack, G-E, Los Angeles; Hiram Z. Andrade, G-E, Los Angeles; H. Guy Haggerty, Philco, Los Angeles; Fred W. Gabbard, Arizona PS, Phoenix; E. D. Thorburn, Sierra Pacific Power, Reno; Paul R. Miller, Westinghouse, Covina.

School Lighting Committee — R. J. Crump, UC, Los Angeles, chairman; J. E. Barnes, PG and E, San Rafael, vice-chairman; Charles Gibson, Dept. of Education, Los Angeles; W. Glenn Balch, Balch, Bryan, Perkins, Hutchason, Los Angeles; Harold F. Hall, So. Calif. Ed., Los Angeles; Byron M. Thompson, El Monte School District; George S. Erskin, Menlo Park; Paul Schmidt, G-E Lamp Div., Oakland; Ralph B. Priestly, San Francisco; Foster Sampson, Los Angeles.

Power Utilization Committee — D. V. Doub, PG and E, San Francisco, chairman; W. F. Lambirth, Calif. Elec. Power, Riverside, vice-chairman; Al Williamson, Arizona PS, Phoenix; Don W. Struck, San Diego G&E; J. R. Parker, So. Calif. Ed., Los Angeles; G. M. Simonson, Walter G. Bayha, Philip Gannon, San Francisco; Garth Chamblin, Electrical Construction, San Francisco; George L. Crow, G-E, San Francisco; R. L. Fontaine, PG and E, San Francisco; Charles H. Kreiger, Ken Oliphant, Charles P. Farrow, Fay J. Lemoge, San Francisco; E. W. Wismer, Sacramento; G. E. Hersam, PG and E, Sacramento; George Appling, Industrial Service Co., Fresno; James A. Blayney, Fresno; T. W. McClosky, PG and E, Fresno; R. E. Bear, G-E, Los Angeles; J. P. Logan, Westinghouse, Los Angeles; Robert A. Lee, A. Schulman Elec., Los Angeles.

Engineering & Operating Section

Guidance Committee — Willis T. Johnson, Calif. Elec. Power, Riverside, chairman; R. E. Bodine, Westinghouse, San Francisco, vice-chairman; E. W. Trenkle, Arizona PS, Phoenix; H. E. Pangborn, Calif. Elec. Power, Riverside; F. I. Nagle, So. Calif. Ed., Delano; K. E. Ducker, So. Calif. Ed., Alhambra; W. T. Lucking, Arizona PS, Phoenix; I. M. White, Pelton Water Wheel, San Francisco; R. W. White, PG and E, San Francisco; Hal Soliday, Fluor, Los Angeles; E. F. Hockenbeamer, PG and E, San Francisco; W. L. Moats, Westinghouse, Los Angeles; Whitman Ridgeway, G-E, San Francisco; R. L. Engle, Allis-Chalmers, Los Angeles; C. D. Ramsden, Pacific Coast Engineering, Alameda; K. M. Bausch, Bechtel, San Francisco; J. F. Sinnott, San Diego G&E.

Accident Prevention Committee—R. W. White, PG and E, San Francisco, chairman; J. E. Smith, San Diego G&E; C. W. Eddy, Calif. Elec. Power, Riverside; William Ismay, Arizona PS, Phoenix; W. E. Brown, Sierra Pacific Power, Reno; R. E. McCann, So. Calif. Ed., Los Angeles; V. L. Dyer, So. Calif. Ed., Los Angeles; H. Heinrich, Hawaiian Elec., Honolulu; H. V. Chambers, Tucson GEL&P, Tucson; Warren S. Hyde, PG and E, San Francisco; Carlton L. Yager, PG and E, San Francisco.

Circuit Breaker Reclosing Practice Committee — H. T. Sutcliffe, PG and E, San Francisco, chairman; W. E. Montgomery, So. Calif. Ed., Los Angeles; J. F. Sinnott, San Diego G&E; B. H. Sexauer, PG and E, Santa Cruz; M. H. Atchison, So. Sierra Power, Reno; Harold E. Pangborn, Calif. Elec. Power, Riverside.

Other Committees

Membership Committee — R. G. Holabird, National Elec., Torrance, chairman; George Beaver, G-E, Oakland; E. H. Galchutt, Graybar, Los Angeles; William De Waard, San Diego G&E; C. E. Thomas, Calif. Elec. Power, Riverside; G. L. Harvey, So. Calif. Ed., Los Angeles; William Siden, PG and E, San Francisco; C. P. Altland, So. Calif. Ed., Los Angeles; N. V. Arntzen, Hubbard & Co., Los Angeles; L. G. Maechtlen, Square D, Los Angeles; H. W. Finnell Jr., Phelps Dodge, Los Angeles; C. H. Thrane, G-E Supply, Los Angeles; George Larsen, Larsen-Hogue, Los Angeles; J. W. Rooney, Fishback & Moore, Los Angeles; B. F. Keyfauver, Graybar, Phoenix.

Representatives on Division of Industrial Safety Committee — L. M. Guibara, U. S. Rubber, Los Angeles, advisory.

Wire Tables Committee — Walter Abraham, PG and E, San Francisco, north; T. L. Van Law, So. Calif. Ed., Los Angeles, south.

Representative on Los Angeles Ordinance Revision Committee — L. P. Shelley, Federal Pacific, Los Angeles.

Representatives on California Employers Safety Committee — Walter Abraham, PG and E, San Francisco, north; L. M. Guibara, U. S. Rubber, Los Angeles, south.

Quick Pickup

Electric Club of Oregon visited Alcoa's new Vancouver aluminum extrusion plant Nov. 4, after hearing from William J. Coleman and E. D. Mairs of Alcoa. On Nov. 18 A. F. Darland, power supervisor, Grand Coulee Dam, described the flood of the power house recently.

San Francisco Electric Club heard R. A. Bowman, chief engineer, power division, Bechtel Corp., discuss the status of "Nuclear Power Today" at the Nov. 1 meeting. Nov. 15 was electronics day, held jointly with the West Coast Electronics Manufacturers Assn.

San Diego Electric Club heard a discussion of electrolytic corrosion by Harry J. Keeling, consulting engineer, Los Angeles, at the Nov. 8 meeting.

East Bay Electric Club in Oakland had pictured to it with a talk by Stanford Anderson of PG and E the trees that should be selected to beautify the streets without interfering with the necessary utilities. On Nov. 15 Frank Falge, General Electric Lamp Division, spoke of lighting opportunities in a talk entitled "75 Down and 10 to Go."

Los Angeles Electric Club held its annual old-timers' meeting Nov. 22 with Carl Heinze as a chairman of the committee. At its Nov. 8 meeting it presented its fifth Electric Club scholarship award to Harold R. Kramer, a senior at Cal Tech.

Electric Club of Washington, Seattle, heard Frank Bodine, manager,

electric utility sales, Westinghouse Electric Corp., San Francisco, give his wide-screen illustrated talk "Ten Years of Opportunity—If?" on Dec. 6.

IES

San Diego Chapter, Illuminating Engineering Society, had a review of "Thirty Years of Floodlighting" from R. B. Johnson, Crouse-Hinds Co., at its Nov. 4 meeting.

Arizona Chapter, IES, held a panel discussion on the "Whys and Hows of Modern School Lighting." On the panel were Lloyd LeRaine Pike, architect, R. E. Tweedy, Day-Brite representative, Ernest Cannon, electrical contractor, Larry Craun, State Department of Health engineer, and C. Harkins, superintendent of electrical work for the State Superintendent of Public Buildings, on Nov. 3.

San Jose Chapter met with the Santa Clara-San Benito Counties Chapter of NECA for a panel discussion on luminous panel systems on Nov. 17. Moderator was Matt Sherwood, NECA field director, and speakers were John S. Walsh, PG and E, Ted Bakeman, manufacturers' representative, John Keyes, Benjamin Electric Mfg. Co., Fred Benz, Smithcraft Lighting, and W. Sears, Sylvania Electric Products. The meeting was in Santa Clara.

Northern California Section, on Nov. 18, had a similar panel discussion on the topic "What Are the Lighting Problems in Large Area Sources." It included architectural, luminous, acoustical and thermal problems associated with such systems. Speakers were John Losh, Sunbeam Lighting, Bernard J. Sabaroff, architect, William Jones, electrical engineer, C. T. Bakeman, Wakefield Lighting, and Robert Schwartz, Oakland electrical contractor.

Oregon Section had its Nov. 10 meeting in Portland and heard Raymond R. Roy, doctor of optometry, on the subject "The Vision Specialist Looks at Illumination."

British Columbia Section was honored by a visit from an old-timer and prominent illuminating engineer of Seattle, Lyman D. Morgan, Pittsburgh Reflector Co., at its Oct. 21 meeting. He spoke on "The Eye as Affected by Quantity and Quality of Illumination." Walter J. Lind, manager of the Canadian General Electric Lamp Division, also discussed "Ceilings Unlimited," describing the evolution of the luminous ceiling from incandescent and fluorescent sources. At the same meeting T. Doherty, chairman, presented certificates of appreciation to W. J. Lind, who had just finished a term as regional vice-president of the IES, and to R. W. Racine, B. C. Electric Co., past chairman of the B. C. Section.

IAEI Vice-president H. G. Ufer presents certificates to George Kimball and Ben C. Hill

Inspectors

B. C. Electrical Inspectors' Assn. heard Norman McClary, electrical engineer, Canadian General Electric Co., speak on "Fundamentals of Motor Circuit Design" at its Nov. 8 meeting. At the previous meeting in October George Evans, conference committee chairman, reported through Mr. Webb and asked for suggestions on the content and arrangements for the forthcoming annual conference next February. Some subjects suggested for panel discussion were: conduit fill and current carrying capacity of wire; fluorescent lighting in relation to its heating effects; and service entrance cable.

Southern California Chapter, International Association of Electrical Inspectors, elected Harry Dobson, Santa Barbara chief inspector, as chairman, Arthur Vesco, San Diego inspector, vice-chairman, and re-elected E. V. Muller, Department of Industrial Safety, as secretary-treasurer. Meeting dates for 1955 were selected as follows: Pasadena Jan. 26, San Diego March 23, Long Beach May 25, Burbank July 27 and South Gate Nov. 9. Ben Wheater, Long Beach inspector, chairman of a committee on uniform service requirements, displayed his committee's recommendations. Action on them was delayed until all members are provided copies and have time to study them. A committee to study the problem of grounding where plastic water piping is installed was named with Art Veit, Los Angeles County inspector, as chairman. Another committee to study code differences among the various cities and counties and submit recommendations to eliminate these was set up with Charles Metzger as chairman. Willard Burk of Huntington Park has been chapter chairman during the past year.

Northern California Chapter, IAEI, honored two of its distinguished old-timers at its meeting in Napa Nov. 10. George E. Kimball, retired, former chief electrical engineer, Department of Industrial Safety, and Ben C. Hill, retired, former chief electrical inspector, Oakland, were presented certificates of honorary membership by H. G. Ufer, retired, former Western superintendent of Underwriters' Laboratories, and still second vice-president of IAEI. Reports from various communities in regard to their participation in National Electrical Week revealed an exceptionally active promotion in that area. Chairman Chester Hefner complimented the inspectors and E. F. Perkins, PCEA, for extraordinary effort. Perkins made a strong recommendation that action be begun immediately to organize for next year's electrical week.

Two associate members have been elected to the executive committee of the Southwestern Section, following the annual convention at Elko, Secretary-treasurer L. E. La Fehr announced. These are H. K. Winterer, General Electric Co., Los Angeles, and William A. Cyr, associate editor, Electrical West, San Francisco.

Central California Chapter, IAEI, heard H. G. Ufer, second vice-president, IAEI, and had a presentation of a film by him at the Nov. 13 meeting in Fresno at Westinghouse Electric Supply Co. Ray E. Colby presided.

Utah Chapter continued code changes discussion under Hal Morr, Utah Fire Rating Bureau, at its Nov. 15 meeting.

Arizona Chapter had as its guest Ben Wheater, Southwestern Section president from Long Beach, at its Nov. 13 meeting in Wickenburg. Another guest was Robert Kerr of Bussmann Mfg. Co. At its previous meeting in Prescott, meeting places and dates for the next year were set as follows: Douglas Jan. 8, Kingman March 12, Flagstaff May 14. Introduction of plastic water pipe, leaving the electrical system without a safe and dependable ground, was brought up and is to receive further study.

ELECTRICAL WEST

Sales Guide

News Letter

December 1954

FOR THE ELECTRICAL MERCHANT OF THE WEST

With promotions, shows and extra advertising, the appliance business took a spurt in December in the usual seasonal pattern. It had been fairly brisk throughout the West the past two months. To get a bigger share for white goods U. S. Steel's "Operation Snowflake" let go with all advertising blazing and local promotions in Denver, Northern California and others supported the drive with activity tied to it.

December spurt

Electric housewares were popular as gifts. The chief hazard to white goods was the highly promoted new car introductions by the strongly competitive giants. The just-as-competitive major appliance makers are in for a battle for the family budget among each other and with autos.

Giants battle

Bombshell of the month was news that G-E would not put list prices on many of its majors. Although such a move had been predicted as an inevitable necessity (Ken Hampton in articles in this magazine two years ago put it in the form of a realistic question), there has been a storm of protest by dealers. G-E points that lists are only used to discount down from either directly or through wild trade-ins or deals. It says prices will find their own level in each area and this may well take the edge off discount appeals. . . A few big department store accounts announced giving up the line.

What is a price?

Sues, Young & Brown, southern California distributor for Norge, Zenith, Lewyt and Ironrite, took the opposite tack--it put these lines under new fair trade franchises and thereby won back Barker Bros., which had tossed out some lines and de-emphasized appliances. McMahan chain and May Co. likewise signed new tight franchises with them. . . Both Norge and Ironrite said they encourage fair trade but leave it to the distributor to enforce. Hence, SY&B really took a courageous stand.

Strong policy

Crystal ball season is upon us again and from the press releases nobody can see anything but rosy for 1955. National Electrical Mfg. Assn.'s fall meeting at Atlantic City bubbled with optimism and programs for the new year. There will be another Go All-Electric drive in rural areas to compete with bottled gas; another to promote electric farm equipment; an electric dishwasher and disposer drive built around The Disposer Boy booklet; and kitchen, range and water heater programs. Then too, the housewares section has a year-round appliance gift plan.

Plenty of promotions

San Diego Bureau of Home Appliances keeps astonishing with the crowds who flood its annual Electrical & Home Appliance Show. Despite pea-soup fog it opened Nov. 26 to a near capacity house crowding the 66 exhibits of 88 products. Sunday's attendance set a new record and they kept coming 'til the show closed Dec. 1. Exhibits by distributors and manufacturers, in a standard snowflake and blue decoration background, were manned by dealers who pitched to sell. Noticeable slowing of sales the month before the show indicated the public waited to see all makes and decide from the show, for sales were heavy and prospects numerous.

Come, see and buy

Color TV sets were shown by RCA, Columbia, Motorola and Hoffman but they had a dry run for no color was being broadcast to San Diego during the show--a wonderful opportunity to reach many people, missed by the industry. . . In fact introduction of color seems to be stumbling rather than running. Maybe dealers are dragging their feet but manufacturers and broadcasters don't seem to know for sure just what---

Not much color

Selling of color sets in areas having sales control for safety has been held up for lack of UL listing. Only RCA, G-E and Westinghouse had listings, CBS had submitted its to UL for test, Motorola also. Color TV sets operate at much higher voltages, require more safeguards.

Checked

Sylvania dedicated its new tube-making plant at Fullerton, Calif., to supply Hoffman and Packard-Bell and other southern California makers. While in San Francisco H. Ward Zimmer, Sylvania president, predicted that satellite stations would be the answer to bring TV to many now blocked areas. FCC will be asked to approve such satellites.

Came West

TV set sales seem to be following a pattern similar to last year's in those cities where monthly distribution figures are kept. In the southern California area, Electric League of Los Angeles reports sales in 1954 lower than 1953 in every month except March. Total sets in the area are nearing 2,000,000. Color sets sold total about 500. Percentage of sales in Los Angeles County is about 77.24, in Kern 7.09, San Bernardino 4.7, Orange 4.08, Riverside 2.87, Ventura 2.06 and Santa Barbara 1.96%. . . Rocky Mountain Electrical League's figures now include those for the Pueblo-Colorado Springs area. In the latter's reception area there are 52,223 sets in use in 16 counties, included in RMEL's grand total of sets sold from 1952 to Nov. 1, 1954, of 253,596.

Sales level

Mort Farr drew exceptionally large dealer audiences when he talked to the Intermountain Electric Assn. retail chapter in Salt Lake City, Nov. 15, and the retail division of Rocky Mountain Electrical League in Denver, Nov. 16. The Upper Darby, Pa., dealer, past president and board chairman of NARDA later, told the press that overproduction of TV sets-again by manufacturers (a million sets a month) can overload the pipelines and bring about dumping and price slashing in January.

History repeat?

January begins show time once more. Right after the usual Chicago market, Los Angeles will have its furniture market Jan. 17-20. Coincident with it will be the 11th California Lamp & Picture Show at Clark Hotel. Western Winter Market will open in San Francisco Jan. 24-28. Feature appliance event will be the radio-TV and appliance trade dinner Jan. 26 at which top-flight speakers will be Harry B. Price Jr., president of NARDA, and William H. Gove, vp and sales director of EMC Recordings Corp. O. R. Doerr, PG and E vp, will be chairman. . . San Francisco Gift Show will run Feb. 3-6, Portland's Feb. 13-16, Seattle's Feb. 20-24. . . Audio Fair-Los Angeles, for the components industry, will be in February too. . . Portland Home Show dates have been set for March 4-14 at the Pacific International Livestock Exposition building.

Shows dates

Tucson Appliance Merchandisers Assn. will stage its first show in January at Pima County Fair Grounds. It will be called TAMA Appliance Festival; will run Jan. 27 through 30; will be heavily advertised and promoted. Entertainment, demonstrations and prizes will be offered. G. A. Larriva is general co-chairman with TAMA Manager R. G. Cox. — First try

Home service department of Pacific Gas and Electric Co. will soon have a well-equipped home of its own with offices and a large test kitchen in 1,200 sq ft of a company building at its Bush St. substation in San Francisco. The display department under Chad Hulburt has moved from it to a new display shop near Station A. Marguerite Fenner, home service director, says the new test kitchen will be used to train the home economists, test all recipes, do experimental work. It will be for staff meetings and use only. . . Ready about Feb. 15. — Home quarters

Much more promotional effort can be expected from all utilities, both private and public, in 1955, all signs indicate. Even Southern California Edison Co., which has been dormant for two years and where the word "selling" just wasn't mentioned, is busy making big plans for a strong promotional program, including one on appliances, for 1955. . . And Salt River Water Users District, serving outside of Phoenix, has been conferring with Sacramento Municipal Utility District's ad agency for plans to promote. The PUDs in the Pacific Northwest have formed a commercial committee of the Northwest Public Power Assn. — All will promote

Edison Electric Institute's schedule of six national campaigns for 1955 will provide utilities with campaign materials and aids that can be used by electric leagues, dealers and distributors. First will come one on dryers, "World's Greatest Wife Saver," in January, February and March. Ranges, "Cook Electrically--It's Clean," will have March, April and May as will water heaters with "It's Tops--Your Electric Water Heater." Freezers with "Buy a Food Freezer Now and Save" will be campaigned from May through August. Ranges will have a second promotion in September, October and November, and housewares will have special gift campaigns in June and December. . . To interest young people in an appliance selling career EEI, as an adjunct to its sales training course, has an attractive folder available, "New opportunities for you in the field of electric appliance selling." — National drives

A roadblock which the gas companies threw up to try to stem the tide of built-in electric ranges in tract homes in the southern California area may backfire. With commission approval they make a high charge for running in pipe to serve heating only on the theory that a built-in range will remain electric. Frustrated at first, builders are now installing cabinet space only for either gas or electric built-in range and the gas companies cannot make the high charge. The home buyer is offered a choice of electric or gas built-in range. Most of them choose the electric. — Can't stop electric

More built-in ranges are being announced. Not only Hotpoint but now G-E has one. It was shown in colors at San Diego appliance show along with colored refrigerator. . . American Kitchens has announced a new Pioneer line of built-in electric and gas ranges and ovens. . . Republic Steel Kitchens now offers steel cabinets designed to accommodate Thermador, I&H, Frosteline or Thor built-in ovens. A base cabinet for the surface units is also offered. — It's a trend

Two much needed adaptors for connecting dishwashers and washing machines without plumbing changes are announced by I&G Supply Co. of New York, a Twin-Mix connector and a pressure releasing faucet adaptor. — Quick

Bill W. Hessler of Midland Specialty Co., RCA distributor, didn't stay elected long enough to take office as president of Appliance Merchandisers Assn. of Phoenix, to succeed George Cornforth. He resigned and Manager Bill Johnson called the board together and elected Arthur Cunningham of Momsen-Dunnegan-Ryan, Philco division manager. Marriel Hamilton, New State Electric, is vp; Harry Burger, Smith & Burger, Tempe, is secretary; Leon Black, Black & Ryan, treasurer. A calendar of promotions for next year and committees to steer them is brewing. Quick change

Snake River Valley Electrical Assn. has been launched in Boise as a promotional league for southern Idaho. Vic Goertzen, formerly with the Chamber of Commerce, is executive secretary with office in Boise. Membership will include dealers, contractors, distributors, manufacturers' agents and Idaho Power Co. New league

Some new distribution changes: Admiral Corp. has set up its own branch in Fresno at 350 O St. with Clinton Price of San Francisco as manager. The line was formerly handled by Billings Wholesale Co. . . McMahon-owned Emerson Central Valley Distributing Co. has been closed and Emerson West Coast Co. has taken over in Fresno at the same location. Thor line also handled had not been changed. But Thor has announced that Lentz Enterprises of Phoenix replaces A&R Distributing Co. of Scottsdale as distributor there and that Standard Supply Co. is now Salt Lake City distributor instead of Walter B. Lloyd Co. . . Stewart-Warner changed its line from Parker Co. to Independent Distributing Co. in Denver, and from Homemakers' in Portland to Harold's Radio Supply Co. in Pendleton. . . . Revco Inc. has appointed these distributors: California Distributing Co. in Oakland, Blomberg's in Sacramento, Chelf's Building Supply in Fresno, California Kitchens in Burbank, R. E. Harris Inc., San Diego, Saviers Electrical Products in Reno, Midland Specialty Co. in Phoenix and Honolulu Seed Co. for Hawaii. . . Deepfreeze has named Radio Television Supply Co. as southern California distributor to succeed Ray Thomas Co., which has revised its operations and also given up James, Mitchell and CBS-Columbia radio and TV, but retains records, Youngstown and A. O. Smith lines. . . James dishwashers named Horn & Cox for Los Angeles. . . CBS-Columbia named Nicolin Distributing Co. as its San Diego distributor. . . And Philco moved its Western regional office from Beverly Hills to 10489 Santa Monica Blvd. in Los Angeles, since it requires more room. Marshall Williams is regional manager. . . Schafer-Wright Inc. was appointed as the distributor for Welbilt electric ranges for Oregon and five southwestern Washington counties. More changes

Some of the recent personnel changes: Don R. Fleming has been made gm of Trav-ler Radio & TV Corp., northern California division. He was formerly with Packard-Bell in Oakland, which will now be handled by Norris Teakle, former Pacific Mercury agent. . . In Los Angeles Elliott Piekoff resigned as vp of sales for Pacific Mercury. . . Harper Dowell, who was division manager for Philco in Los Angeles-San Francisco areas, becomes regional sales manager for Whirlpool in Pittsburgh. . . W. H. Anderson, former Frigidaire appliance sales manager in Los Angeles, has been appointed division assistant general sales manager in Dayton. . . Ward R. Schafer, once of Hotpoint, later Deepfreeze and recently partner in Schafer-Wright Inc. of Portland, distributors, has been named West Coast regional manager of the TV and radio division of Bendix Aviation Corp., replacing Bartley C. Furey who has been transferred to Baltimore. . . . Two former H. R. Basford Co. old-timers who resigned recently have been appointed by George Hornstein, president, Pioneer Appliance Co. of San Francisco, to new posts with his company--Vernon Vissiere and John Henry Stone. . . A. Forni has been named Zenith products field sales manager at H. R. Basford Co. Men move

A barrel full of contest entries was ready for the drawing by Bureau Directors Frank Runyan, George Tenney, L. H. Bennett, Jack Ross, Charles Goodwin as climax to the . . .

Jubilee's Biggest Promotion

It is the tally sheet that counts. And by its record of the results obtained, plus the territorial scope covered, the Edison Light's Diamond Jubilee promotion staged by Northern California Electrical Bureau throughout the Pacific Gas and Electric Co. territory was probably the biggest of all promotions tied to the anniversary of light.

The tally is just now being made. It is not complete as yet but from the samplings taken the percentages allow projections to size up what the market can be if it is followed up as it was designed to be.

The total number of entries in the contest was 106,719. From this 35 were drawn to receive the appliance of their choice. First prize was the appliances to make a complete electric kitchen, and Mrs. Milton R. Vail of Piedmont won that. In all, $20,000 worth of appliances were given, plus 5,000 lamp bulbs.

But the significant results from the contest lie in the possibilities for sales. Even the sales during the contest are remarkable. After the contest closed about one-third of all dealers in the PG and E system were contacted by division people, a total of 770 dealers. They reported a total of 14,992 prospects developed as a result of the contest and 831 actual sales for a total of $261,108.35 dollar value. Projecting these figures for the total it has been estimated that the dollar sales for all dealers ran more than $1,000,000.

San Jose division found that 131 of its dealers had developed 4,464 prospects and made 362 sales for a total of $98,030. San Joaquin power division with 127 dealers reporting had 2,360 prospects and made 81 sales for a total of $50,262. North Bay division had 16 dealers report 1,320 prospects, 84 sales for a total of $24,816. These figures were as of Nov. 19.

Each entry was required to go to an electrical dealer's store, one who displayed the campaign banner, and there make a selection of the major appliance he or she wanted to win, list its make and model number on the coupon, write or print his or her name and address and deposit it in a box in the dealer's store. This gave the dealer an opportunity to show (labeled with a diamond-shaped sticker), demonstrate or explain and even sell the appliance. In the latter case, should the person win in the drawing the dealer offered to refund the price.

These entry blanks, listing the appliance wanted, are now to be returned to the dealers listed on them by the entrants to become a prospect list. Before they were returned an analysis of them is being made. The San Francisco division tabulated every one of the 16,985 entries received and found the number of each appliance named and from this calculated the per cent of the total. The San Francisco tabulation is shown in the box below.

Appliance	No. Received	%
Refrigerator	4,341	25.5
Television	3,679	21.7
Washer	3,002	17.6
Range	2,103	12.4
Freezer	1,622	9.5
Dryer	1,049	6.2
Dishwasher	718	4.3
Ironer	338	2.3
Miscellaneous	83	.5

The surprising part of these results was the strong showing for refrigerators and freezers. Refrigerators have been so taken for granted that it was not realized what a replacement market there may be. And after the collapse of freezer plans it was a surprise that in San Francisco itself there was evidently as strong a desire for freezers still existing.

To tabulate the entire 106,719 entries in as thorough a fashion as San Francisco division had done was so big an undertaking that on advice of a research organization it was decided to make a sampling of 5,000 and check these against the total San Francisco count to see if the same pattern per-

sisted. Remarkably close percentages for each appliance came from this sampling, as the results show (see box below).

Appliance	Per Cent Choosing	Projected Total
Refrigerator	20.7	22,000
Television	18.2	19,360
Washer*	18.0	19,150
Range	15.1	16,080
Freezer	14.3	15,200
Dryer	7.7	8,180
Dishwasher	3.4	3,620
Ironer	1.4	1,490
Air conditioner	1.1	1,170

* Includes 2.1% who named washer-dryer combination

In this tabulation the projected total is an estimate of the total number of prospects there are in the total 106,719 based on the number in the 5,000 sample. By sheer chance, of the 35 drawn for prizes eight were for refrigerators, 9 television, 5 washers, 7 ranges, 3 dryers, 1 freezer and 2 dishwashers.

The promotion was launched throughout northern California in PG and E territory during the first two weeks of October in a series of 27 meetings in all the divisions to a total attendance of 1,914 dealers. They were all supplied with window banners, diamond stickers to paste on their top-of-the-line appliances and entry coupons and a poster of Edison for a window trim. Big ads ran in all dailies and weeklies in the area telling of the contest, giving the rules and a coupon. Rules were that only one entry could be made by a person and it had to be a PG and E customer. This occasioned considerable work eliminating those who duplicated or were otherwise ineligible. (One ambitious entrant who ignored the rules put in more than 500 entries.)

As a morale builder for dealers and distributors the contest and promotion was just what was needed. It revived a downcast industry and set it back on the road to selling again. Those who participated and promoted too were successful with it. A few cynical ones who "knew" it was going to fail realized that aim—for themselves.

It was felt by O. R. Doerr, PG and E vice-president of sales, and by his staff, John S. C. Ross, residential sales director, Walter Lind, dealer coordinator, and by division sales personnel to have been one of the most successful promotions since before the war. Northern California Electrical Bureau directors and Manager LeRoy H. Bennett were equally enthusiastic and are talking of some kind of similar promotion in 1955.

Typical of meetings throughout the area to get ready for contest promotion was this one in Eureka. Doug Heller, PG and E sales manager, speaking. Len Dedini, Fortuna dealer, president of Humboldt Appliance Dealers Assn., and George Cornwell, meeting chairman

Backing Electric Heat Again

First electric heating promotion since before World War II will be carried on by Pacific Gas and Electric Co. throughout its northern California territory in January. This was announced to a meeting of electric heating contractors, manufacturers' representatives and distributors by John S. C. Ross, manager domestic sales, Oct. 28. The news was welcomed by the electric heating men who for several years have felt that their product was being resisted by the utilities of the West. The new power supply situation, together with high summer peaks, is attributed as the cause for the renewed interest in electric heating.

The dealers and installers were acquainted with the plans in order that they might tie in and capitalize upon them to the maximum, Ross said. He then outlined a campaign of advertising which includes two large-size advertisements in approximately 300 newspapers in northern and central California, during the first and second weeks of the month, a full-page ad in *Sunset*, a million bill stuffers to the company's customers, 350 outdoor poster boards, 2,500 truck banners. Ross also offered floor space for display by the suppliers of electric heaters.

Announcement was made of the arrangements completed with leading banks in the area for financing of wiring in connection with the sale of electric heaters as well as appliances.

Particular stress was laid on the need for the industry to recommend proper house insulation, at least in the ceilings of the rooms in which electric heaters were installed.

Fair trade and refranchising of all dealers of Norge appliances, Zenith radio and TV, Ironrite and Vornado lines by Los Angeles distributor Sues, Young & Brown marks major effort to stem discounting, recognize dealer franchise value. Distributor President Pete Sues explains new policy to Long Beach dealers and prospects at one of many meetings

Put Wiring on the Bill in Spokane

Wiring finance plan announced by Washington Water Power Co. in a series of dealer meetings last month is to be run on a trial basis through Dec. 31. It applies to existing homes now wired and served by the company and is contingent on satisfactory credit of the home owner. The contracts are limited to the cost of residential wiring and lighting fixtures, including a service entrance. Plumbing can be handled too when it is incidental to installation of a major electric appliance.

The maximum contract amount is $350, minimum $35 and time can extend 36 months. The customer is billed by the utility. As explained to the contractors and dealers, they offer this financing for the wiring and submit the name of the customer for a credit rating. The contract is entered into with the customer and, when the work is completed satisfactorily, customer and dealer sign a statement and the note is assigned to the power company, which pays off the contractor and begins billing the customer.

First announcement was made at a big meeting of 225 dealers, distributors and contractors from the Spokane and Big Bend divisions. Kinsey M. Robinson, president of WWP, declared it a war against obsolescence and an aid to the entire industry to keep selling electrical appliances, lighting and usages. Since the company's revived selling program was begun 10 months ago, he said, 480 kwh has been added to the average residential usage. The company's sales representatives averaged 200 prospects a week for electric dealers, bringing an increase of 6% in appliance sales.

In the last three-month campaign, only freezers failed to top the quotas set. Refrigerators went over the top with 107% of quota, ranges 113. However, a total of 1,403 freezers was sold in the territory served by Inland Empire Electric League. Water heaters to the number of 1,560 were just short of the quota also. Water systems, 248 of them, topped the quota for 131%.

The final quarter's campaign is known as "Mother's Helper," and has quotas of 2,400 dryers, 2,100 automatic washers, with more emphasis on ranges, water heaters, space heaters, lamps, lighting fixtures and electrical gifts for Christmas. The Electric League is offering $100 for the best sales promotion ideas submitted by Nov. 20.

Seeing makes believing as appliances were switched on and the meter indicated demand

Eugene Enters Show Business

A live demonstration is better than a canned and taped talk. This was found by the Eugene Water & Electric Board during the Lane County Fair this fall in Eugene when the board set up an exhibit to explain the recently revised rates and show the relationship of customer demand to system investment.

Heart of the exhibit was a large a-c wattmeter in the center of a large wheel whose segments were marked off for kilowatt demand and system investment. Around this were displayed an electric range, dryer, refrigerator, washer, water heater, disposal and dishwasher, as well as electric space heating units. As each appliance was energized the wattmeter registered the demand.

It was found that the demonstration attracted crowds but a recorded 90-second narrative did not hold them and they went on. After one day's operation of a four-day event, the explanation was worked into the demonstration by Merle P. Bailey, electrical engineer and rate specialist for the board.

Selling a good wiring installation to the farmers who came to the Spokane Interstate Fair Don Jordin, Washington Water Power Co. rural representative, explained to thousands. Brown-Johnston Co. furnished the equipment. Randall Johnson designed display

ELECTRICAL WEST

Everybody Likes Treasure Hunts

IN the slogan "Treasure Hunt for Net" the Administrative Services Section of PCEA has come up with a timely and worthwhile suggestion. Any organization in any branch of the electrical business can heed it with profit. Any efforts that are expended to find ways and means for increasing net are likely to be rewarding.

The task of furnishing acceptable service at a price the customer is willing to pay and at the same time to return a profit is becoming more and more complex for manufacturer, distributor, dealer, contractor and utility. All are being squeezed by the same set of economic conditions—higher costs of doing business and customer resistance to higher prices. In the case of all but the utility, there is the added weight of competition to make the problem of building up net income more difficult.

The areas in which a treasure hunt for net can be conducted are legion. They range from budgeting and accounting to better utilization of manpower and greater use of mechanized equipment. Record keeping is a rich and promising field for savings. So too is expense control. In fact, as one utility executive puts it, any procedure, report or record that has been in effect for more than ten years warrants the closest scrutiny to determine its value in terms of today's needs.

About the best commendation we can give the Administrative Services Section guidance committee for devising this slogan is to report that we are going to start a treasure hunt for net in our own business!

The Heat (Electric) Is On

BRUCE BARTON once said "action and reaction, ebb and flow, trial and error—**change**—are the rhythm of life." One needs only to examine the attitude of utilities toward residential and commercial electric space heating to see the validity of the Barton observation. From coast to coast and border to border more and more utilities are putting space heating high on the list of desirable loads. Maligned, disdained, questioned and criticized by engineers and utility executives, especially during the postwar years when system capacity was a problem, electric heating has suddenly become a valuable and desirable load balancer.

Two things account for the change. One is the tremendous upsurge in the popularity of summer air conditioning and the other is the rapid development of the heat pump into an economically feasible appliance. However it is air conditioning that has put the strain on residential distribution systems and has built residential summer demands up to a point where additional facilities are needed to serve them. And to make the necessary investments pay out, the power company sales departments have turned to electric heating as the complementary winter load. It has been singled out to improve domestic load factor.

ELECTRICAL WEST has long contended that electric heating was a desirable and economical service which the customer should be permitted to use and enjoy as long as he was willing to pay a compensatory rate. This view has been shared by manufacturers, distributors and contractors. But many utility people found countless arguments why electric heating was unfeasible and uneconomical. In some instances policy was established to discourage it.

Now those days have passed. The heat is on. Which only goes to prove that nothing is more certain about change, than change itself.

The Real Dixon-Yates Issue

REMOVE the emotionalism and the partisanship from the Dixon-Yates controversy and the issues become quite clear and simple. No less a person than President Eisenhower is authority for that statement. Fundamentally the policy to be decided is whether the federal government should intrude where it is not needed. There is no more reason for the federal government to accept responsibility for the power supply of the nation than to furnish its food, drinking water, housing or transportation.

EDITORIAL VIEWS

President Eisenhower has written a letter to Congressman Cole of New York that spells out the TVA-Dixon-Yates issues in simple language. Here is what the President says: "It seems to me that all arguments for the construction by the federal government of the additional steam plants ignore this one and very important truth: If the federal government assumes responsibility in perpetuity for providing the TVA area with all the power it can accept, generated by any means whatsoever, it has a similar responsibility with respect to every other area and region and corner of the United States of America.

"Logically, every section of the United States should have the same opportunities, and the federal government should not discriminate between the several regions in helping to provide this type of facility. My own conviction is that we have not been alert enough in making certain of this equality of treatment. If this is the case, then it is high time that other regions were getting the same opportunities.

"I cannot believe that Americans, in general, disapprove of attempting to place all regions on a basis of equality in this regard. Consequently, there must either be some re-examination of any plans which would call for the federal government to supply all the additional power capacity that might be needed in the future in the Tennessee Valley, or logically we would have to begin plans for a gigantic power development to cover the entire nation equitably."

As we have said, take away the emotionalism and the partisanship and the American people will accept whatever is in the best interest of the country. The Dixon-Yates contract is just that.

Two Columbia River Compacts Needed

IN the past month two significant developments have focused attention on the greatest water and power resource in the U. S.—the Columbia River. In one instance representatives of seven Pacific Northwest states approved an interstate compact to coordinate utilization of the water in the Columbia River Basin. In the other a proposal of Kaiser Aluminum & Chemical Corp. to store Columbia River water in Canada for downstream power development brought out the need for an international agreement on division of the water and power resources of that great stream.

The state compact, which must be ratified by Congress and the various state legislatures, differs in many respects from other interstate agreements on water rights. It does not attempt to allocate water among the seven states as did the bitterly contested Colorado River Compact. It gives irrigation and municipal use of water in the upper states priority over power use in the downstream industrial areas of Oregon and Washington. Finally it assures the upstream states a share of the future power developments. The commission which the compact sets up must advise Congress and the FPC on the minimum amount of power that should be earmarked for the upstream states. All of these constitute desirable compromises of issues that could prove troublesome in the future.

No such progress has been made with a Canadian agreement. In fact the plans of the Kaiser organization bring into sharp focus the areas where Canada and the U. S. must reach an accord. Principal one is the benefit payment Canada is to receive for downstream power generation made possible by water stored in British Columbia. The Kaiser people have agreed to furnish British Columbia with 20% of the additional power such storage would provide from the power plants in the U. S. from Grand Coulee to Bonneville. However these negotiations are purely preliminary and have no standing in international diplomacy. They simply point up the need for urgency in the studies that an International Joint Commission is making at present.

Both the interstate and the Canadian compacts are essential for the future maximum development of the resources of the Columbia. Both should be expedited, because an orderly power development program on the Columbia is necessary for the expanding economy of the Pacific Northwest.

ALL NEW G-E CAPACITOR

Field-tested assembly over *50* percent stronger handles one or two copper or aluminum lines; exerts 1000 lbs. contact pressure through corrosion resistant connector.

Every General Electric outdoor capacitor with glass bushings now has a stronger terminal that's far easier to handle.

Here are the details that give this sturdy new terminal its practical advantages:

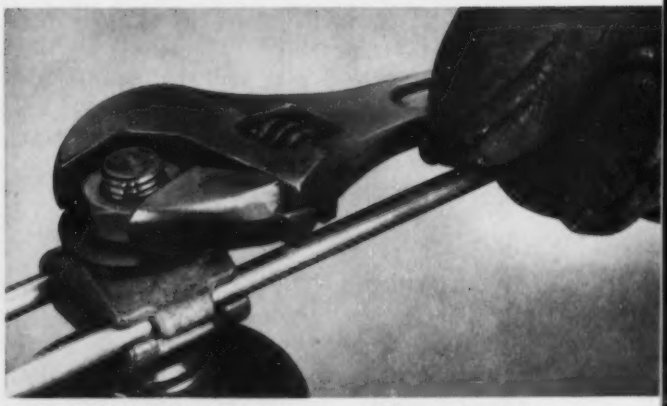
1. Conductors can be quickly inserted in the assembly without threading. **2.** One or two copper or aluminum conductors from No. 10 AWG solid to No. 2 AWG stranded can be clamped securely. **3.** Two Belleville washers exert a constant pressure of over 1000 pounds, forcing the parallel-groove connectors to follow the cold flow of aluminum. **4.** The hex nut will strip without damaging the terminal stud if excessive tightening torque is applied. It can easily be replaced with a new nut. **5.** Accidental loss of this nut is reduced because the top threads on the terminal stud are staked. Yet, if necessary, the nut can be forcefully removed. **6.** The parallel-groove connector is tin-plated to provide good conductivity and minimize corrosion.

Every element of this design has produced a strong and dependable terminal assembly requiring a minimum of time and effort to connect. Ask your G-E Apparatus Sales Engineer for more information. General Electric Company, Schenectady 5, New York. 441-23

Progress Is Our Most Important Product

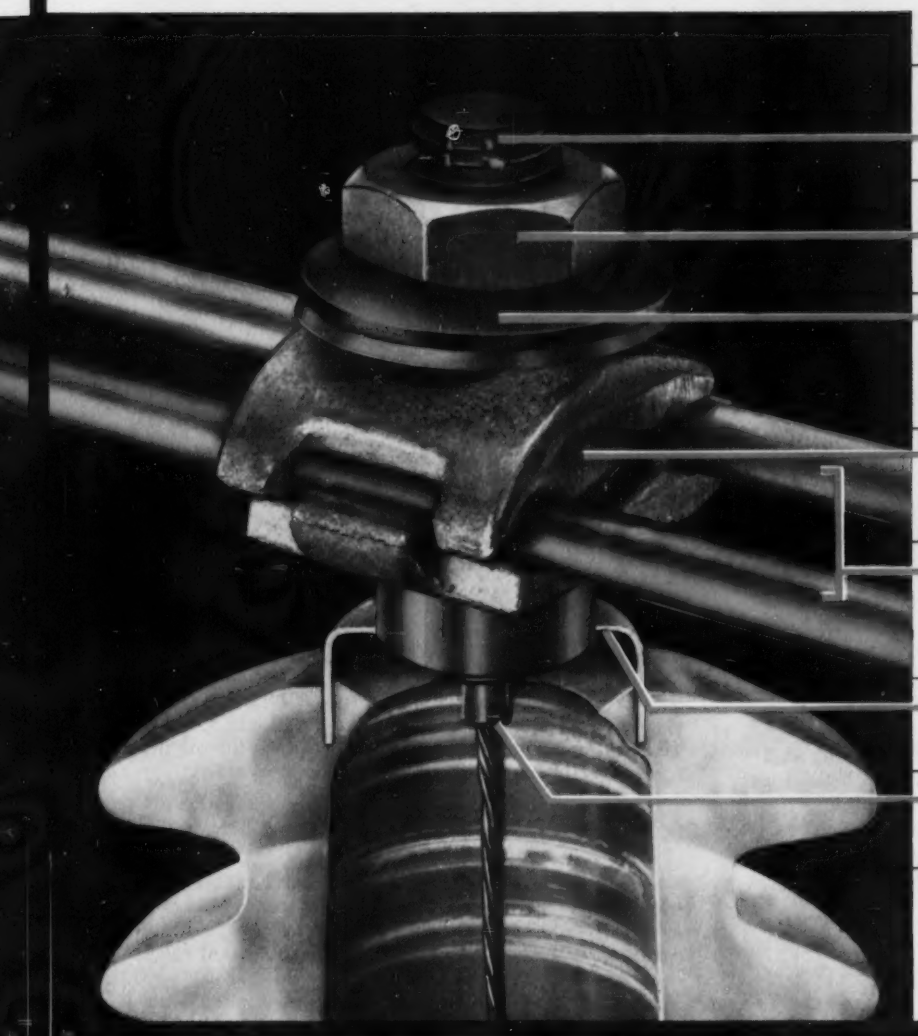
GENERAL ELECTRIC

NO THREADING of conductors is needed with parallel-groove connector. Loosen nut and conductors slip in place.



BELLEVILLE WASHERS maintain over 1000 pounds contact pressure on connector. Flat washers indicate proper torque.

TERMINAL *at no price increase!*



STAKED THREADS
keep assembly from being accidentally removed

NUT STRIPS FIRST
if excess torque is applied, avoiding damage to stud

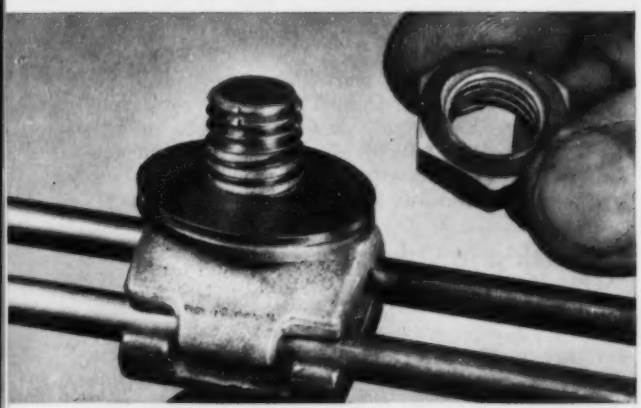
POSITIVE CLAMPING
with Belleville washers follows cold flow if aluminum conductors are used

TIN-PLATED CONNECTOR
provides good conductivity and minimizes corrosion

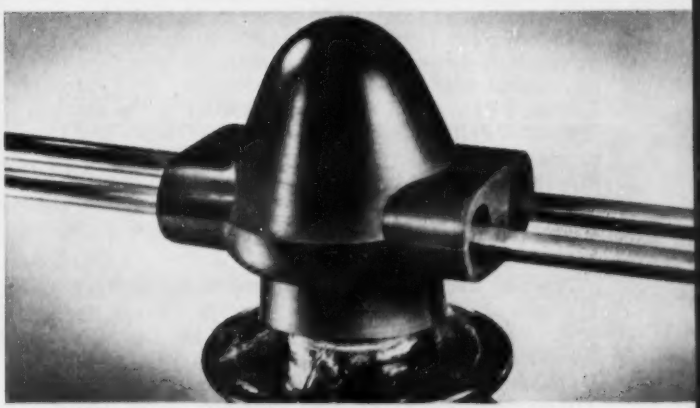
HOLDS 1 OR 2 AL OR CU CONDUCTORS
from No. 10 AWG solid to No. 2 AWG stranded

PRESSURE-BRAZED TO CAST-IN-GLASS FLANGE

CRIMPED AND BRAZED LEAD-WIRE CONNECTION



NUT STRIPS BEFORE THE STUD, preventing damage to stud threads due to excess torque. Nut can easily be replaced.



PROTECTION against birds and rodents is provided by this rubber cap which fits securely over the entire assembly.

THE MONTH IN BRIEF

Supreme Court Will Decide

Dispute between FPC and the State of Oregon over licensing Portland General Electric Co.'s proposed Pelton Dam will be decided by the Supreme Court. FPC issued a license for the project, which includes a dam and power plant to be built on government land and a reregulating dam on private property. State wildlife organizations joined Oregon's attorney general in challenging FPC's jurisdiction. Last February the Ninth Circuit Court of Appeals held that federal ownership of the dam site does not empower the U. S. government to use the waters contrary to state law, basing its decision on the Desert Land Act of 1877. Filing with the Supreme Court for review of the decision, FPC argues that the statute does not permit states to exercise their police powers to block projects approved by the appropriate federal agency; that it does not apply to the Deschutes River project, since the area has been reserved for power purposes and is not "public land"; that the power company has offered to install special facilities to aid spawning fish. In accepting FPC's appeal, the high court denied PGE's request to intervene.

Voters Dissolve PUD

Union County, Ore., approved dissolution of its PUD on Nov. 2 by a vote of 3,652 to 1,912. After a bond issue to finance acquisition of California-Pacific Utilities Co. properties in the area was defeated twice within three months (EWEST, September, p 124), PUD directors asked that the dissolution proposal be placed on the November ballot. During its tenure the PUD spent more than $109,000 of taxes raised by special levy in accordance with Oregon PUD law. It was formed in November 1940 and brought its condemnation proceedings against California-Pacific in September 1949.

PUD Proposals Defeated

In two other Oregon counties, voters defeated PUD proposals. North Lincoln County voters decided four to one against annexation of the territory by the Central Lincoln PUD, which serves communities to the south. Tillamook PUD's proposal for a $2,700,000 bond issue to extend facilities was turned down 3,694 to 2,535. Both areas are served by Pacific Power & Light Co.

Vote Improved Lighting

Portland voters decided two to one to tax themselves 1½ mills or $1,000,000 annually for ten years to modernize the street lighting of some 1,140 miles of streets, labeled among the worst lighted in the nation. Other capital fund levy proposals on the ballot were defeated. The lighting project was first proposed by the Junior Chamber of Commerce, which launched an "Operation Nite-Lite" campaign before election. Demonstrations included installation of modern fixtures on 12 heavily traveled blocks.

Council Upholds City Light

Seattle City Council upheld contention of City Light officials that the Port of Seattle should not be permitted to sell electric power to its tenants. The port has been buying city power and reselling it at a profit.

Power Use Council Permanent

Response of the industry to the recent area meetings of the Inter-Industry Farm Electric Utilization Council (EWEST, November, p 132) resulted in a decision to form a permanent organization with a continuing program to encourage more widespread and efficient use of electricity on the farm, it was announced by REA. All members of state power use committees will be invited to attend a two-day workshop in late January.

Rehearing Called on Wells Site

FPC has granted a rehearing of its order granting Douglas County PUD a preliminary permit for a hydro project on the Columbia River at Wells (EWEST, November, p 146). Puget Sound Power & Light Co. had asked for a similar permit and was denied in the original order.

B. C. May Build Dam

Threat that Ottawa might try to block Kaiser Aluminum's plan to build a storage dam on Arrow Lakes in British Columbia (EWEST, October, p 120) brought announcement by the provincial government that it might itself build the dam. Kaiser wants to build a $25,000,000 low-level dam at Castlegar to increase storage for downstream generation on the U. S. side. Provincial government has given conditional approval, provided it gets back 20% of the power generated. Ottawa objects on grounds that the B. C. government is undercutting Canadian industry by providing power to U. S. interests at insufficient return; warns that it intends to amend the Fluid and Electricity Exportation Act to cover export of regulated water by licensing permits. Provincial authorities indicated that B. C. could build the dam and new legislation requiring Kaiser to obtain a license would not apply.

Partnership in Colorado

A partnership plan was discussed recently in Washington, D. C., by representatives of the Colorado UTE Electric Assn. and Western Colorado Power Co. The plan would cost about $25,000,000. It includes a generating and transmission system to be built by the co-ops with help of an REA loan and to be integrated with the power company's existing system to cut power costs. Tentative proposal is for a 20,000 kw steam plant and about 150 miles of transmission line.

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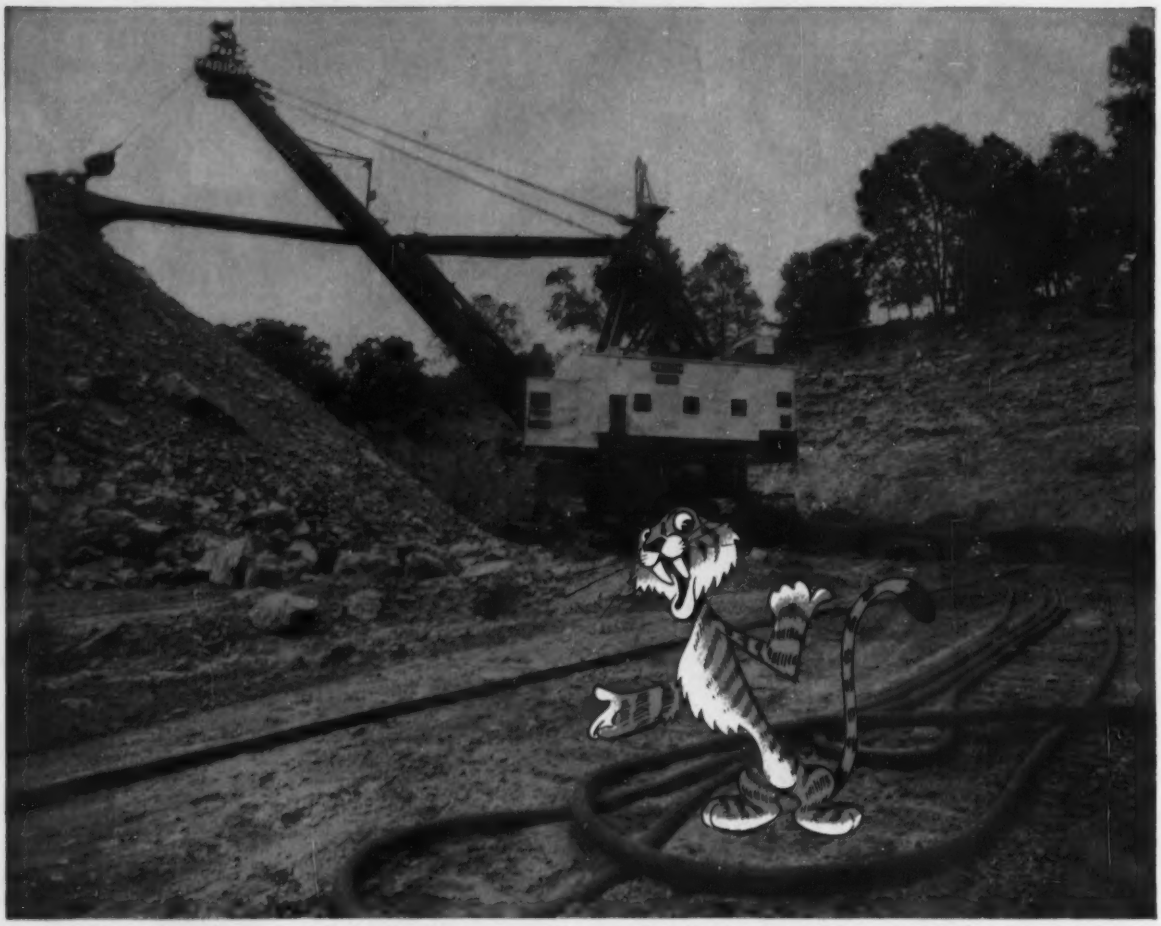

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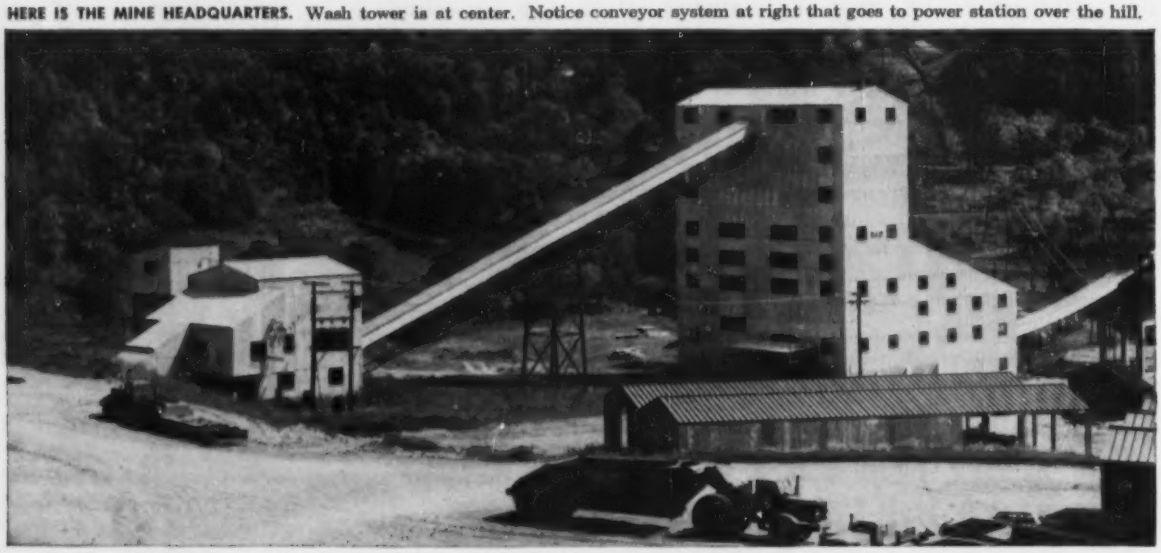
HERE IS THE MINE HEADQUARTERS. Wash tower is at center. Notice conveyor system at right that goes to power station over the hill.



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THIS MONTH'S NEWS

Columbia Compact Draft Approved by Commission

The seven-state compact to govern development of water resources of the Columbia River Basin was given final approval by the interstate commission in Portland Nov. 11 and was to be submitted at public hearing in Seattle early this month. Except for minor changes and rewording of a power allocation phrase, the draft presented in Spokane (EWEST, November, p 138) was approved by the commission.

The power allocation article provides that reservations be made to the state or states in which the project is located and shall be the sum of the full amount of prime power and energy that would be developed at that project were it to be operated on an isolated basis and a fair and equitable share of power developed at site and at existing and future downstream plants under coordinated release of water less loss of generation because of streamflow depletions resulting from beneficial upstream water consumption in the state concerned.

Membership will give the four major states (Oregon, Washington, Idaho, Montana) two commissioners each and the federal government one nonvoting member, who will be chairman, and the other ratifying states (Nevada, Utah, Wyoming may participate by ratification) one vote each. Eight votes would prevail.

Ratification of the four principal states and consent of Congress is necessary to make the document effective.

Joint Agencies Study Canadian Storage Plans

Joint federal agency studies of nongovernmental proposals for Canadian storage to develop hydroelectric generation in the Pacific Northwest's Columbia River power grid are being pushed for early decisions. This was announced in Portland last month by Col. L. H. Foote, North Pacific division, Army Corps engineer, and William A. Pearl, Bonneville Power Administrator.

Washington Water Power Co., Kaiser Aluminum Co. and the Puget Sound Utilities Council have under consideration in British Columbia the Mica Creek, Arrow Lakes and Kootenay Lake sites. Downstream power production would be provided by stream regulation by these projects, principally storage structures, and would also provide flood control benefits.

Any principle of upstream storage and downstream benefits developed on the basis of data being compiled in the current studies would also apply in the U. S. proposal for Libby Dam on the Kootenai River in Montana, where part of the reservoir would be in Canada and the generation at downstream plants in both U. S. and Canada would be increased.

Meeting with Col. Foote and Dr. Pearl in a recent conference which determined the scope of the studies were Harold T. Nelson, Boise, regional director, Bureau of Reclamation; Arthur M. Piper, Portland staff scientist for Pacific Northwest geological survey; Leslie S. Wing, regional engineer, Federal Power Commission. The joint Corps - Interior announcement said discussions are going ahead with the nonfederal sponsors to determine mutual understanding of the merits of the potential sources of additional kilowatts.

NAM Survey Estimates California Power Needs

Gross capital expenditures of more than $1.5 billion from 1954-60 will be required of California's principal investor-owned electric utilities to keep pace with increasing population, according to a National Assn. of Manufacturers survey.

The estimated $1,506,816,276 needed for 1954-60, added to the actual expenditures during 1951-53 brings total expenditures required for the decade to $2,181,308,709. This refers only to expansion of electric facilities; another $699,375,861 are needed during 1951-60 for expansion of gas facilities.

The study by NAM's Western division research department predicts California utilities will have to spend more during the 1950-60 period to expand facilities than those in any other of the 11 western states.

The California study is based on estimated 1960 population of 14,919,000, compared to 10,586,223 in 1950.

Colorado Voters Amend Utility Regulations

Colorado voters at the November election empowered the State Public Utilities Commission to regulate the facilities, service and rates of all privately owned utilities in the state.

The amendment does away with a blind spot in state utility regulation. Home-rule cities long had been beyond the PUC's control, bringing on court and ballot tests in recent years.

Denver voters a year ago voted to give the state commission jurisdiction over private utilities in that home-rule city. The amendment approved by state voters, two to one, gives the commission regulatory authority over the other home-rule cities: Colorado Springs, Pueblo, Boulder, Delta, Durango, Fort Collins, Fort Morgan, Grand Junction, Montrose, Monte Vista and Wray.

A similar proposal was rejected by voters in 1952, apparently because of inadequate explanation prior to the election.

Pilot Knob Plant Now Under Construction

Actual construction of the 33,000-kw Pilot Knob generating plant of the Imperial Irrigation District is under way after 22 years of planning and controversy.

The $10,000,000 project on the All American canal six miles southwest of Yuma, Ariz., and just north of the Mexican border, was first contemplated in 1932.

At groundbreaking ceremonies Nov. 8, Evan T. Hewes, chairman of the board and executive superintendent of the Imperial Irrigation District, outlined the long years of negotiation with Washington. He blamed former interior secretary Harold Ickes for siding with upper Colorado River states in delaying the project.

The breakdown of the $10,000,000 power development project, includes $70,000 for site work; $153,901 for construction (Morrison-Knudsen Co., submitted the low bid in this amount), $6,440,890 for the generating facilities; $1,150,360 for substation and transmission lines; $1,510,750 for distribution facilities; $826,000 for interest during construction.

65 tons of Youngstown Buckeye Conduit at Cleveland Airport

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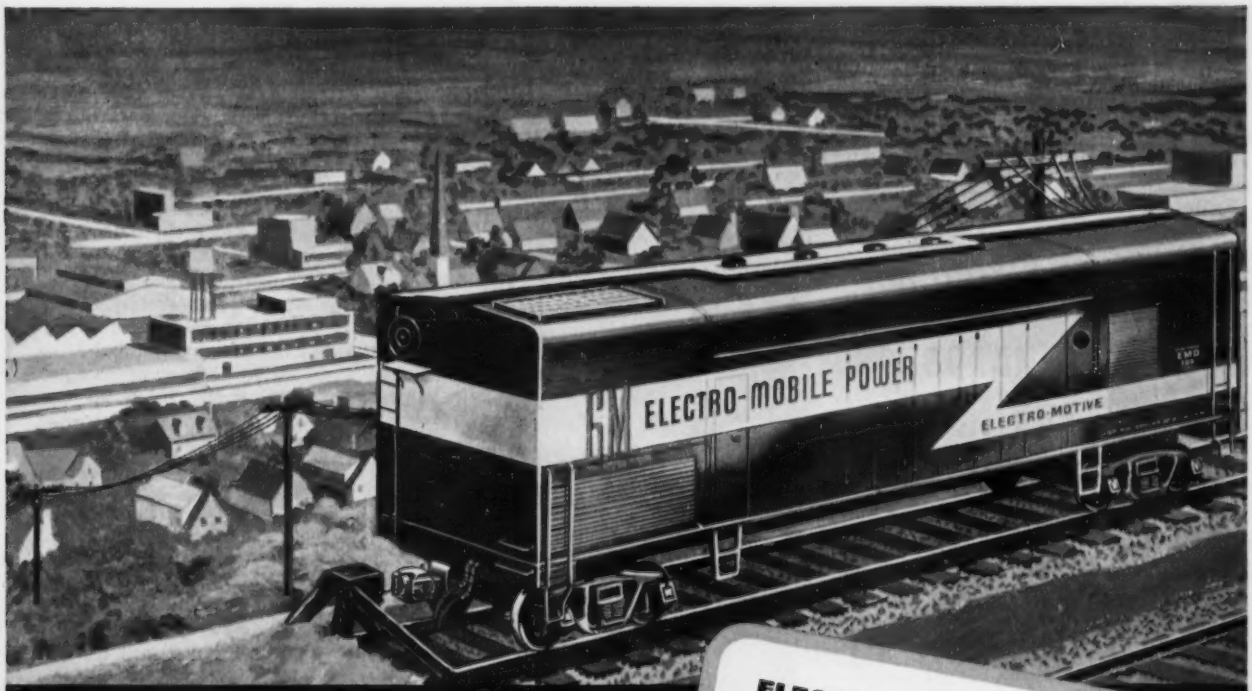

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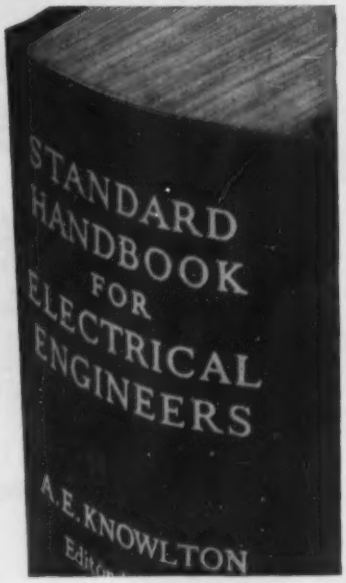

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COMPANIES OFFER PLANNING FUNDS

Three private utility companies—Portland General Electric, Pacific Power & Light and Washington Water Power—have offered to advance $350,000 of planning funds to the Corps of Engineers to get field exploration and preliminary design for the John Day Dam and power house on the Columbia River under way during the low water winter months immediately at hand. Virtually a full year of time would thus be gained on starting construction of this multipurpose project deemed the most prospective major undeveloped site on the lower Columbia.

The John Day was authorized as a federal project in 1950 and figured in a "partnership" bill which languished in the 1954 Congress but the utility group explained its offer was made with "no strings attached" and without relationship to whether the site ultimately is developed by the U. S., by a private utility or a group. Should Congress later appropriate funds for the dam, the companies would be reimbursed. But the offer specifically states the companies expect no interest on the advance and fully realize the project might never be built.

Concerned About Shortage

PGE President James H. Polhemus and PP&L President Paul B. McKee said the offer was induced by the "grave concern" the three firms felt over the "pending power shortage in the Pacific Northwest, which will develop early in the 1960s if no new large projects are brought into operation prior to 1963."

Corps would handle the planning work which Polhemus, in his letter offering the advance under a 1925 law to Col. J. U. Moorhead, Portland district Army engineer, said should be done this winter, otherwise "initiation of construction may be delayed at least a year no matter how the project may be undertaken." And he said a check will be issued the U. S. treasurer upon notice of approval by the Secretary of the Army. "As the best working season is fast approaching, your expeditious handling of this matter will be appreciated," Polhemus concluded.

The joint statement of the companies noted that "along with several associates" the firms have been endeavoring to get John Day started under a partnership arrangement whereby the "local electric systems and industries" would finance the power costs, which would amount to about half the estimated $325,000,000 cost.

Planning funds amounting to $700,000 had been sought in Congress, but

in the late weeks of July the House-Senate conference committee had deleted the $500,000 Senate approved figure. At the time it was said John Day planning may require up to two years work.

Utilities Council Would Consider Additions

The Puget Sound Utilities Council would consider building a third power house at Grand Coulee Dam and adding two generators at Chief Joseph Dam to utilize water stored behind the proposed Mica Creek Dam upstream on the Columbia River in Canada, L. E. Karrer, executive vice-president of Puget Sound Power & Light, a member company, said last month.

Jack Stevens, consulting engineer for the council, previously had said that downstream storage benefits from the Canadian project would make the new capacity feasible at Grand Coulee and Chief Joseph.

Stevens declared that the 10,600,000 acre-ft of usable storage from the Canadian development would increase the Columbia River's flow at the two dams to the point where all existing generators at Grand Coulee could run most of the year and six others of like size would be needed there, plus two more at Chief Joseph and another two at The Dalles Dam. Authorization of the Grand Coulee power house would have to come from Congress.

Stevens said the government could be repaid for its investment in the third power house in blocks of power provided by the council.

"We would provide the storage and the federal government would provide the generators," he said, "should such a plan be adopted."

The Mica Creek development ultimately would provide 1,200,000-kw for the Pacific Northwest, with members of the council to build the dam for $250,000,000 and Canadian interests to build a power house at the site.

Members of the council are Puget Sound Power & Light, Seattle City Light, Tacoma City Light, Snohomish PUD, Chelan PUD.

• **Chelan County PUD** is conducting seismograph tests on a proposed hydroelectric dam site on the Wenatchee River near Leavenworth, Wash., for a proposed 145,000-kw project, according to Manager Kirby Billingsley. Similar tests will be made at the Rocky Reach site on the Columbia River north of Wenatchee, where a larger development is proposed. FPC has granted a preliminary permit for the Wenatchee River project.

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Idaho Power Files Initial Brief at Washington, D. C.; Summarizes Company Testimony in Hells Canyon Hearing

Initial brief in Idaho Power Co.'s hearing before a Federal Power Commission examiner for licenses to construct the Oxbow, Brownlee and Hells Canyon hydroelectric projects was filed at Washington, D. C., late last month. It summarizes the company's testimony in 137 pages.

Pointing out that issues involved in the hearing are matters of fact rather than issues of a legal nature, the brief states: "In reality, the sole issue before the commission is whether the applicant should be granted licenses upon its pending applications, or any modifications thereof that might be required by the commission.

"In determining this ultimate issue," the brief continues, "the commission must ascertain whether the applicant's plan is best adapted to a comprehensive plan for improving or developing the waterway involved." Summary of the company statement:

"We can say that the company's projects fully meet the tests of a multipurpose development because (1) They provide the best and most economical power development of the full head of the river; (2) they provide superior navigation benefits, and can comply with the necessity of a minimum downstream release of at least 5,000 cubic feet per second for navigation requirements; (3) they provide adequate flood control and, in fact, all the flood control storage capacity that is economically justifiable in this reach of the river; (4) they provide outstanding and superior recreational advantages, and afford better conservation of fish and wildlife resources; (5) they will provide tax benefits to the public estimated at $9,750,000 annually—or more than $487,500,000 over a 50-year license period—without any investment whatever of public funds.

"It is doubtful if any project could be presented which more completely meets the definition of a multipurpose development than does the applicant's three-dam proposal. "

The brief states that intervenors in the hearing "are not applicants for licenses for any project, and have offered nothing which they propose to do themselves. Their position is in no way constructive. Their alternative—to meet the pressing power needs of the Pacific Northwest—is their wishful thinking that some future Congress may authorize, and provide funds for, the highly propagandized single dam at Hells Canyon, although proposed legislation to this end, under consideration and debate in three past Congresses, has consistently failed of passage."

Emphasizing that expanding load requirements in Idaho Power's market area make the immediate construction of the three plants imperative, the brief describes the projects in detail.

"Each one, in its own right, is a project of large size," the brief states, "and each one will make a notable contribution to the power-short Pacific Northwest. Collectively, their power supply—783,400 kw of at-site installed capacity—will be comparable to that which would be produced by other proposed projects costing many times more in public money.

"Intervenors derogatorily call them small dams, probably to imply unfavorable comparison with, and in an attempt to justify misguided worship of, their much-adored single dam at Hells Canyon. With no other motive can the use of the term 'small dams' be explained.

"Together the three projects will develop the total head of 602 ft available in the Hells Canyon-Weiser stretch of the Snake River. Their initial installed capacity of 783,400 kw will provide peaking capability of 900,800 kw. Provision is made for subsequent additions to bring the total installed capacity to approximately 1,175,000 kw, with associated peaking capability of over 1,300,000 kw, whenever regional generating facilities and load shape require this enlarged peaking capability.

"Nowhere in the region, probably nowhere in the nation, can a power installation of this capacity be provided in an equivalent period of time or at so low a cost as $169.75 per kw installed."

The Oxbow project can be completed in 24 months after start of construction, it is estimated, and the Brownlee and Hells Canyon projects within 30 months.

The power company brief cites the engineering testimony of Federal Power Commission engineers that the benefit-cost ratios for three-dam development are more advantageous than for the proposed single dam at Hells Canyon; that the benefit-cost ratio for the additional power that would be produced by the single dam over and above that produced by the three-dam development would be less than unity.

"Whatever comparison is made," the brief states, "it is obvious that additional power production (from the single dam) would be exorbitantly costly, and that the cost thereof would be in excess of its value."

The brief quotes expert testimony to the effect that the cost of additional power from the single dam would be two to three times the cost of the power generation from steam.

Reviewing the need for more electric power in the Pacific Northwest at the earliest possible date and the speed with which Idaho Power's projects can be completed, the brief points out that "the minimum net gain to the region from Idaho Power's projects over the single dam during the interval before the latter could reasonably be expected to be completed would be over 41.5 billion kilowatt-hours. This amount of power would have a minimum value of $208,000,000, it is estimated.

Association to Carry on Fight; Collecting Funds

National Hells Canyon Assn. will carry on its fight against Idaho Power Co.'s proposed Snake River development and at its annual meeting in Portland, Nov. 20, started collecting an additional $10,000 for that purpose. It also came out against Pacific Northwest Power Co.'s proposal for the lower Snake.

The association spelled out its intent in a resolution that noted: the "people of the Northwest and the nation have demonstrated their renewed determination for an expanded and dynamic federal multipurpose dam building program including Hells Canyon and are asking for aggressive leadership in carrying out this mandate."

The treasurer reported the organization had spent $84,000 since June 1953, most of it to oppose the private company proposal for the Snake.

All officers were re-elected. James T. Marr, Portland, is president; Vince Cleaveland, Clark County PUD manager, is vice-president; Elmer McClure, Oregon grange master, is secretary-treasurer.

• **A second supplement** to the Atomic Energy Information Kit has been issued by the Electric Companies Public Information Program. It contains the text of the new Atomic Energy Law of 1954, interpretative sections pertaining to the electric power industry, editorial comment on the bill and major event in the nuclear field since the last supplement was issued.

• **An all-time high peak** for power generation by the Los Angeles Department of Water and Power for its own customers was set Nov. 15. New record, 1,054,000 kw, occurred at 5:30 p.m. Previous high peak was 1,028,000 kw on Jan. 12, 1954.

Tap the Line in Half the Time with SQUEEZON

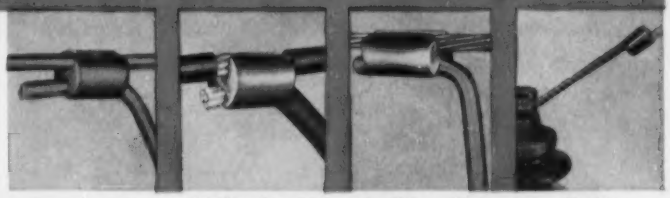
"ONE-CRIMP" CONNECTORS

The Fast, Low-Cost Way to Make Overhead Connections

One crimp . . . and you've got the connection!

That's all it takes when you make a line joint with a Squeezon and a Squeezon compression tool. You get a *better* connection . . . a perfect bonded, permanent joint. That's because Squeezon connectors provide *separate*, full-circumference grip on each conductor, eliminate galvanic corrosion on transfer surfaces.

Squeezon economy and all-around utility will please you. Your line crews can handle any job in half the time and at a fraction of the cost of conventional methods. One Squeezon tool and two types of connectors . . . the aluminum and the solid copper . . . meet all line requirements.

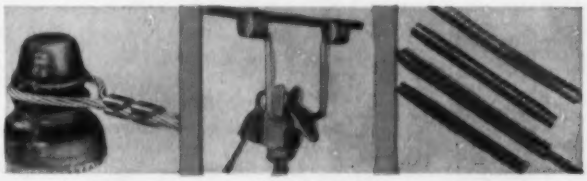


Copper Squeezon
One operation of the Squeezon compression tool permanently bonds this type of joint.

Aluminum Squeezon
Aluminum connector for aluminum conductor provides large area contact—prevents cold flow, for aluminum-to-copper or copper-to-aluminum. No special connector necessary.

For T Connections
Costly special connectors are eliminated by the use of Kearney Squeezon, for aluminum-to-copper connection.

Tap On
Squeezon's weld-grip high pressure bonding makes perfect aluminum-to-copper terminations.



Dead-Ends
One crimp per Squeezon saves time when multiple connectors are used.

Stirrup Tap
Two Squeezons and a short piece of wire make an inexpensive, easy-to-install stirrup, insures a rigid arc and corrosion-proof connection on hot lines.

Line Splice
Line splices are better electrically and mechanically with Squeezon sleeves.

The Squeezon Tool with controlled hydraulic pressure cold welds the connector to the conductor—tool hangs easily to conductor fully supporting its weight.

For Better Construction . . . Safer Maintenance

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KEARNEY Products

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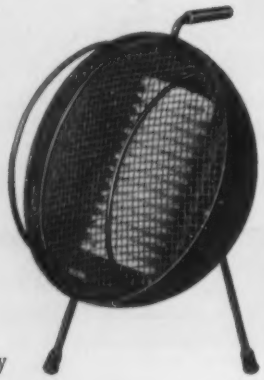
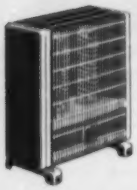
To help you profit from Electric Heat



To help electrical dealers in Northern California profit from the Pacific Gas and Electric Company promotional plans for electric heating next month, WESIX announces these aids to more sales:

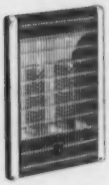


THE ALL NEW WESIX "FIRE BALL"

A completely new heater that promises record sales in the auxiliary heater field, the "Fire Ball" is designed with modern furniture in mind—a heater modern as tomorrow that will sell today!

POWERFUL TELEVISION SCHEDULE

Every weekday during January, WESIX dealers will sponsor the KOVR Channel 13 ten o'clock news program, "Dateline Diablo." Because of KOVR'S wide coverage, dealers throughout the coast and central valley areas can profit by joining this co-op program.

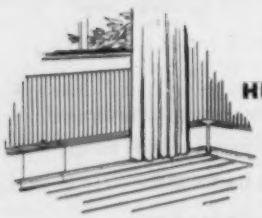


DISPLAYS • SIGNS • BANNERS

For use in utility showrooms or in dealers' stores, WESIX has a complete line of display material as well as window banners designed to tie-in with this program.

RADIO AND NEWSPAPER ADS

A wide variety of dealer ads and radio copy will be available for the full 50% co-op credit to help dealers add impact to P. G. and E'S electric heat advertising.



HEATING BOOKLET

The booklet that has proved itself a first rate salesman of electric heating during the past year, "Design for Modern Electric Heating," will be available to dealers to help clinch sales that will mean more profit, not only in January, but in all of 1955!

Don't delay. If your shop is not receiving the WESIX Wiredheat Bulletins covering this record promotion, write today—and contact your WESIX jobber salesman or representative for further details!

WESIX Wiredheat AUTOMATIC Electric HEAT

WESIX ELECTRIC HEATER CO.
390 FIRST STREET
SAN FRANCISCO 5, CALIFORNIA

GROUP CHANGES PLANS: WILL STUDY NEW SITES

Pacific Northwest Power Co. has dropped plans for a dam at Penny Cliffs on the Middle Fork of the Clearwater River in northern Idaho. However, it is asking Federal Power Commission approval of plans to study proposed dams at Mountain Sheep and Pleasant Valley sites in Idaho and Oregon.

Pacific Northwest Power Co. is made up of four private power companies. Its president, Kinsey M. Robinson, said the group has asked FPC for a preliminary permit for a two-dam project that would cost more than $200,000,000 including transmission lines to load centers. Robinson said the financing would be entirely from private sources.

The combine proposes a 233-ft dam at Mountain Sheep on the Snake River generating 250,000 kw, and a 492-ft dam at Pleasant Valley with 600,000-kw capacity. Both sites are below Hells Canyon on the Snake and above the mouths of the Salmon and Imnaha Rivers, two important streams for migratory fish that would not be obstructed by the proposed dams.

Robinson indicated that opposition from wildlife associations and supporters of the Lewis & Clark highway in northern Idaho prompted the firm's decision to abandon the Penny Cliffs site. Although Corps of Engineers had contended the dam would not materially damage wildlife, the Pacific Northwest Power Co. felt the opposition of sportsmen's groups and talk of major relocation of the highway would delay the project too long a time.

The Pacific Northwest Power Co. already held preliminary permits for studies of the Penny Cliffs and Bruce's Eddy sites on branches of the Clearwater River. Robinson said that the group intends to amend its permit by withdrawing the Penny Cliffs location, but will continue engineering studies at the Bruce's Eddy site.

The company is made up of Washington Water Power Co., Pacific Power & Light, Montana Power Co. and Portland General Electric Co.

Second Valley Plant Unit to Go on Line

Second 100,000-kw generating unit at Los Angeles Department of Water & Power's $75,000,000 Valley steam plant was scheduled to go into service before Christmas. The first 100,000-kw unit was put on the line in September and two 156,000-kw machines will be installed in 1956. Total plant capacity will be 512,000 kw.

Illustrated above is 1955 Footlighter baseboard Model 645

Ummm! doesn't she look cozy?

No wonder—because her home has electric

CONTINENTAL RADIANT *Glassheat*®

- **Over 100,000 satisfied user installations in the Pacific States.**
- **All installations are thermostatically controlled, giving high diversity factor.**
- **All Continental GLASSHEAT units are guaranteed.**
- **Continental methods of selling and installation insure finest customer relations.**
- **Manufactured by the *original* and *largest* electric glass heating company.**

Continental GLASSHEAT gives each room the clean, beneficial infra-red heating rays that provide luxurious personal comfort. Each room is thermostatically controlled for heating to the exact temperature that suits the individual—*automatically* without attention. Warm floors and healthful humidity are maintained throughout the home.

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STEAM PLANTS TO SUPPLEMENT HYDRO in the Pacific Northwest will be needed by 1960, J. Frank Ward, managing director of the Washington State Power Commission, declared recently, using charts to point up his remarks. Steam now provides about 10% of Northwest power. Ward predicts that it may provide up to 25% within the next decade. With more than one-third of the nation's hydro potential, the Northwest will need steam plants to firm up secondary or interruptible hydro, he said. Upstream storage on the Columbia would not solve the problem, he declared, since it would mean more secondary power to be firmed up. He saw the possibility of some power from atomic energy but only when the cost is reduced to the point that it can compete with conventional thermal power. Shown with him at a recent meeting are Walter S. Gordon (left), commission chairman and Harry Hudlow, Franklin County PUD manager

FIRST UNIT of San Diego Gas & Electric Co.'s Encina plant near Carlsbad, Calif., went into service last month. Shown after recent dedication ceremonies in front of the 100,000-kw unit are: Jerry Mann, supervisor of generator construction for General Electric Co.; Emery D. Sherwin, president, San Diego Gas & Electric Co.; M. Hjalmarson, superintendent of plant construction for the company

Second Unit Ordered for El Segundo Plant

Installation of a second 156,000-kw generating unit has been ordered by the Southern California Edison Co. for its newest steam-electric station, the tidewater plant now being built at El Segundo, according to James F. Davenport, vice-president and general manager.

Continued growth of electrical load on the Edison system has made necessary the ordering of a second unit at El Segundo. The initial unit, construction of which was started last October, will be placed in service next July. The second unit is expected to be ready for operation in September of 1956. The total cost of the El Segundo station with both generating units in service will be approximately $46,000,000.

BASIN COMMITTEE STARTS LONG-RANGE PLANNING

Long range planning for Pacific Northwest power requirements, perhaps beyond 1980, in the field of hydroelectricity, steam generation and nuclear energy supply has been authorized by the Columbia Basin Inter-Agency Committee. The assignment, handed to five full-time engineers on loan from four of CBIAC's major agency members, will work under the power planning subcommittee but will not duplicate work of the Northwest Governors' Power Policy Committee, which is concerned with needs of the next 10 years.

But the approval called for consideration of the ultimate development at each hydro project that can be economically justified, comparable evaluation of storage and run-of-river plants and an improved base for transmission planning to insure that the shorter-range programs fit into the objectives for longer-range requirements.

Initially, the engineering staff will represent Bonneville Power Administration, Corps of Engineers, Bureau of Reclamation and the Federal Power Commission.

With long range aims under way, CBIAC meeting last month in Portland turned to agenda of the engineering and the fisheries steering subcommittees of the governors' organization to hear progress reports on problems posing obstacles to some 36 prospective project sites.

Considering the newness of the science of fishery management, the incomplete attack on the Columbia River problem and the inadequacy of funds available to fish scientists, we are led to believe that with proper attention and financial support the fishery resource of the Columbia not only may be saved but may be measurably improved, the committee reported.

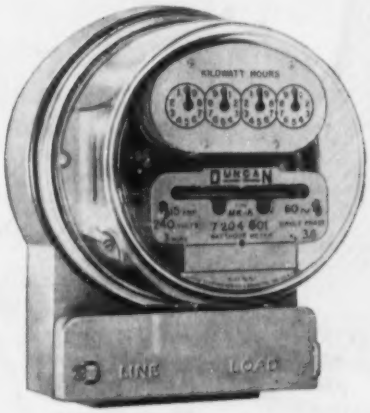
Preliminary studies of fish and wildlife problems at the 36 hydrosites on which the governors have concentrated attention are estimated at $685,000.

The committee's report said "specific funds must be procured from congressional or state legislature appropriations, from benefited commercial and sport fishermen, from project sponsors, or from a combination of these sources." But the discussion indicated a more likely source would be a formula whereby such preliminary studies could be shared by the agency or company interested in the site and the state in which the site was located. Then, if the dam is built, the study cost paid by the state would be compensated from project costs. If the site is abandoned, the data would still be of value.

THE NEW DUNCAN SINGLEPHASE METER

TYPE MK*

TYPE MK-S



TYPE MK-A

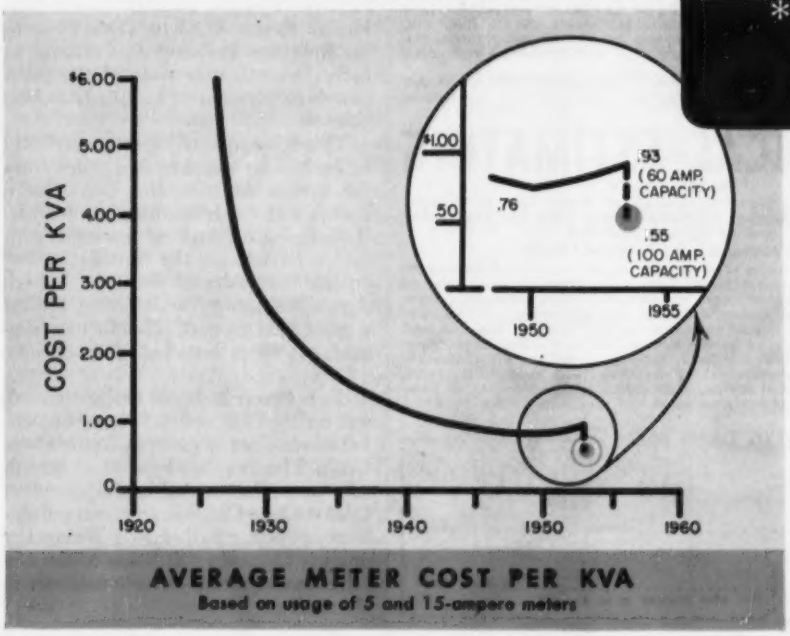
● The Duncan Type MK singlephase watthour meter is a completely new design with increased capacity to keep ahead of the expanding use of electric energy. The general purpose service Type MK meter, although nominally rated at 15 amperes, has "extended range" capacity to accurately meter continuous loads to 100 amperes. This has been done with no sacrifice of performance at lighter loads.

The MK Gives You:

- **CAPACITY** — "Extended range" load characteristic *plus* adequate thermal capacity — metering of services to 100 amperes.
- **COORDINATED INSULATION** — Coils molded in polyvinyl chloride — protective gaps flash over at 4,500 volts r.m.s. — approximately one-half of the insulation level.
- **CONTINUING DUNCAN FEATURES** — Adjustments accessible from front . . . No adjustments of worm wheel mesh or bearings necessary . . . Alnico damping magnet . . . Time proven bearings . . . Convenient register re-set.

DUNCAN ELECTRIC MFG. CO.
LAFAYETTE **INDIANA**

Pioneers in Extended Range Metering



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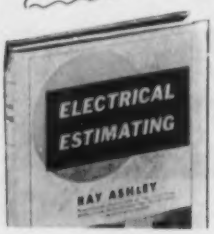
ELECTRICAL CONTRACTORS AND ESTIMATORS



This book shows

HOW TO ESTIMATE THE COST OF ANY ELECTRICAL JOB

IN this manual you'll find all the information you need to estimate the cost of an electrical construction job . . . quickly and accurately. It is packed with time-saving methods, tips and guides that help you streamline your estimating procedures—give you the know-how that means safer and more dependable bids. It covers everything from the selection and training of electrical estimators and the proper use of estimating tools . . . to the cost of preliminary estimates and the preparation of final bid sheets. You'll find, too, helpful information on the design and use of estimating forms, the importance of weights and measures, and meeting special estimating requirements.

Scores of sample estimates of actual construction costs make this book a "must" for anyone who wants at his fingertips the best in professional electrical estimating.

ELECTRICAL ESTIMATING

By RAY ASHLEY

Research Engineer, Electrical Contractors' Assn., City of Chicago; Member, Chicago Electrical Estimators' Assn.: Electrical Engineering and Estimating Consultant

307 pages, 6 x 9, illustrated, $8.00

REFLECTING 25 years of experience in all branches of the electrical-contracting industry, this book gives information of value to the contractor, estimator, and engineer who must solve daily complex problems of estimating, appraisal, cost accounting, job scheduling, or supervision. Clear explanations, plus sample estimates and guides, show you how to handle lighting and power branch wiring—distribution equipment—auxiliary, summary, and final bid sheets—overhead and markups—checking estimates—and estimating special projects and residential wiring. Time studies and preparation of labor cost units, as well as studying plans and specifications are examined in detail.

Covers . . .

- estimating forms
- estimating tools and their proper use
- studying plans and specifications
- taking off quantities
- listing and checking material quantities
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SITE FOR OROVILLE DAM FEASIBLE, STUDY FINDS

A. D. Edmonston, California's state engineer, announces exploratory work has indicated the site for the Oroville Dam on the Feather River has been found geologically feasible.

He reported this was shown as the result of diamond drilling operations conducted by the Boyle Brothers Drilling Co. of Salt Lake City, Utah.

The diamond drilling work, Edmonston reported, indicates the rock at the proposed damsite is an exceptionally hard medium and therefore adequate for the foundation of the structure.

The State of California has appropriated some $1,500,000 for studies to determine the feasibility of constructing the Feather River Project, an estimated $1.2 billion venture contemplating a dam and power plant near Oroville and transportation of water through the Sacramento and San Joaquin Valleys into southern California over the Tehachapi Mountains.

State Engineer Edmonston hopes to submit a report on the project's feasibility at next year's session of the California Legislature.

Already on the statute books is a law permitting the state to issue revenue bonds for construction of the project if it were found to be feasible.

New Sign Installed Atop Public Service Building

Eight thousand feet of neon lighting tube will flash a rose, green and white "Pacific Power" message from atop Pacific Power & Light Co.'s 21-story headquarters building at Portland in early December as part of the company's celebration of Light's Diamond Jubilee.

The 4,800 sq ft of "spectacular" will be legible for perhaps two miles from the downtown site and the colored flashes will reach considerably farther, R. J. Foley, advertising manager, estimates. In daylight the "Pacific Power" on the four sides of the 19½ ft high sign will show yellow lettering against a grey background. The former skymark sign was installed 27 years ago.

• **Utah Power & Light** Co. last month was testing its new $10,500,000 66,000-kw steam-electric plant at Castle Gate, Utah. The facility, located at mouth of a coal mine owned by Independent Coal & Coke Co., was to go on permanent operating basis late in November or early December. It is one of the few mine-mouth steam-electric facilities in the nation.

VALLEJO ELECTRIC WILL BE TAKEN OVER BY PG AND E

California's Public Utilities Commission has authorized Pacific Gas and Electric Co. to take over the 57-year-old Vallejo Electric Light & Power Co. in Vallejo, Calif. Actual date of take-over cannot be determined until FPC approval is secured.

PG and E already owns most of the utility's stock. It has been operated as a wholly controlled subsidiary since 1949.

Value of Vallejo Electric was listed as $1,626,635, with annual revenues of $1,208,000. The company has 14,500 customers.

Minor Difficulties Solved On Tension Stringing

Minor difficulties that developed in the tension stringing of the 1.6-in. ACSR conductor on Bonneville Power Administration's 345-kv line from McNary Dam to Vancouver, Wash., have been solved and work was resumed on a regular basis on Nov. 15. Flaring of some of the strands in the outer layer of the conductor for short distances has caused shutdown of the job for fear of greater corona that would cause radio interference. The 1.6-in. conductor is near the critical diameter for 345 kv and hence initial stringing operations were watched carefully.

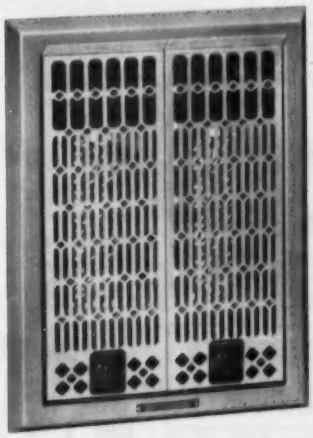
Changes in the original stringing operation as reported in ELECTRICAL WEST, September 1954, p 98, include use of rubber-lined sheaves and stringing winches to help maintain tension so that the conductor will just clear the ground. Alcoa engineers worked with the contractor, Bay Construction Co. and Don L. Cooney, on stringing procedure. Alcoa is reported now to be stranding the conductor by a continuous operation instead of by the overlay method. This new cable appears to be satisfactory. About half of the original $4,000,000 order for cable had been delivered when the stringing trouble developed. Reject ratio on reels being strung was about 25%.

Stringing difficulties on the large cable were not unanticipated by the cable manufacturer or Bonneville since it was the largest cable ever made by Alcoa or used by BPA. For that reason stringing methods on the first 80-mile section of the 345-kv line were considered experimental to work out "bugs" as they developed.

• **Seattle City Light** has secured 38 acres of land in the city's industrial area as the site for a steam plant proposed for construction in the indefinite future.

FLOOR MODEL
3 sizes —
230 volt AC with "Adjust-o-matic" thermostatic control. Streamlined design fits in any room.

SELL THE DESIGNS SPECIFIED BY SURVEY

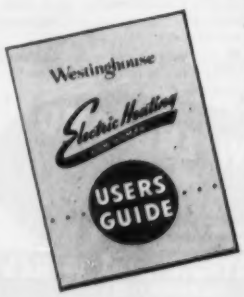


WALL MODEL
9 sizes —
230 volt AC with "Adjust-o-matic" control. 3KW size fits into standard stud spacing.

First a national survey was conducted to determine the true heating needs of today's home-owner. Then Westinghouse built the units that best served those needs. Now you can sell electric heating designed for modern living.

Westinghouse offers your customers clean, safe, economical heat — automatically regulated room by room at the flip of a switch. And you can answer every individual housing requirement with smartly styled floor and wall models in all types and sizes that install in minutes, last for years — the **only** heaters that won't discolor or change their heat constancy.

YOU CAN BE *SURE*... IF IT'S Westinghouse



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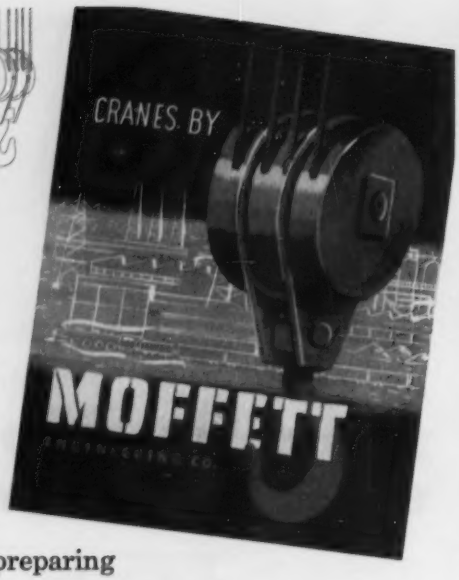

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IN THE FIELD as in laboratory tests . . . Crapo Galvanized Steel Strand proves itself capable of withstanding severe punishment. Steel's inherent strength and durability are combined with definite economies in every size and grade of Crapo Steel Strand. You'll find the heavy, ductile, tightly-bonded zinc coatings, applied by the famous Crapo Galvanizing Process, provide lasting protection against corrosion.

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- SUPER-NEMCOITE Composite bonded for equipment or machinery. Flexible or rigid sheet, tubing, or combined with Fiberglas.
- MICA COMMUTATOR INSULATION Rings, Segments, Sleeves to specifications.
- MICA MOLDING PLATE (Thermoplastic) Sheets, stampings or molded forms.
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CUT IN BUREAU BUDGET BRINGS STAFF REDUCTION

One hundred top-ranking engineers, designers and researchers in the Bureau of Reclamation's planning and engineering headquarters at Denver have been dismissed.

L. N. McClellan, assistant reclamation commissioner and chief engineer for the bureau, said "This reduction was necessitated by a cut in the Reclamation Bureau's budget voted by Congress last July."

The notices were sent out the second day after the Nov. 2 election but McClellan denied reports—current at the Denver Federal Center—that the dismissals had been held up until after the election for political reasons. He said the "reduction in force" had been imminent for "several months" because the bureau is not planning any large new construction.

McClellan said all of those to be discharged are in the higher civil service classifications and are experts in their fields. He said most of them "can do much better, as far as salary is concerned, in private industry."

Failure of the 83rd Congress to approve either the Frying Pan-Arkansas diversion project or the Upper Colorado Basin Project was blamed for the reduction.

Despite the cutback, the bureau's engineering offices at Denver will retain 1,200 employees.

Turbine Contract Awarded For Petersburg Plant

Petersburg, Alaska, has awarded a $116,164 contract to Allis-Chalmers Mfg. Co. to furnish a hydraulic turbine, water wheel generator, switchgear and automatic controls for a 2,000-kva hydroelectric power plant.

Designed by R. W. Beck & Associates of Seattle, the plant will utilize water from the Crystal Lake watershed. Supervisory control equipment will allow the plant to be started, stopped and remotely controlled from the dispatcher's office in town, 17 miles from the power house, with only weekly visits for inspection.

The plant is scheduled to go into operation Nov. 1, 1955.

• **Hawaiian Electric** Co. began tests at its new Ala Moana steam plant last month and expects to have it in operation by the first of the year. Started 20 months ago, the plant will bring the company's total power potential to 270,000 kw. Ultimately it will have a second generating plant.

AGREEMENT REACHED ON AREAS TO BE SERVED

An agreement on territories to be served has been reached by the Salt River Power District and Arizona Public Service Co.

For all practical purposes, the agreement maintains the status quo, but it irons out questions that have arisen during recent years of expansion. The pact brings up to date a 50-year agreement drawn by both companies in 1928.

Most of the city of Phoenix is served by Public Service with the district operating in the surrounding valley and in some districts recently annexed by the city. According to the new agreement, Public Service will make all retail sales in four surrounding districts, but agrees to purchase power from the district for these areas.

Also, in 1957, Public Service agrees to begin buying an initial block of 50,000 kw of electric power for use within valley cities and towns with right to later increase the purchase.

The power district will continue to provide all power required for mining, milling, and associated operations, but will sell to Public Service the power the company needs for other purposes in this territory.

The district agrees it will not serve outside its designated territories. The company agrees it will not serve inside the district's territories, except for towns and cities in the valley and for resale in Gila County territory.

Southern Nevada Power Will Order New Unit

Southern Nevada Power Co., Las Vegas, has announced it will order a second steam generating unit for a plant now in the preliminary construction stage.

Need for a second unit became apparent when numerous requests for large blocks of power from the first unit were made by commercial and industrial users, according to D. D. Smalley, vice-president and operating manager.

Rated capacity of the first units is 44,000 kw. The second unit is expected to have a capacity of 60,000 kw, it is reported.

The plant, located near Whitney, 5 miles from Las Vegas, is only one of its kind in Nevada. Stearns-Roger, contractor, expects to complete it in 17 months.

Smalley said he expects the steam plant to operate with at least 90% load annually.

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NEWS ABOUT PEOPLE

Edison Company Makes Personnel Changes

Changes in Southern California Edison's engineering and operating departments were announced by James F. Davenport, vice-president and general manager. **W. L. Chadwick,** vice-president, will assist Davenport in engineering and technical responsibilities. **C. M. Cavner,** formerly manager of operation, has been made assistant vice-president to assist the general manager's office on system operation and special assignments. **W. E. Montgomery,** formerly general superintendent of system operation, will replace Cavner and **R. N. Coe,** formerly general superintendent of distribution, transmission and communications, will be assistant manager of operation. **D. A. Denholm** steps up from chief production engineer to superintendent of system operation. and **E. W. Messer** takes his former post.

In other moves within the Edison organization, **E. N. Husher** will direct automotive transportation and mobile equipment activities; **T. C. Stavert** has been made superintendent and **R. T. Enloe,** assistant superintendent, of hydro generation.

BEST ANNUAL REPORT of the nation's small electric utilities was the citation presented to Portland General Electric Co.'s Board Chairman Thomas W. Delzell at the 14th annual Financial World banquet in New York. He is shown (left), receiving the award from Weston Smith, executive vice-president of Financial World

• **Harold C. Jenseth** has been made plant manager of the San Francisco plant of General Electric's Distribution Assemblies Department.

Ingledow

• **Thomas Ingledow,** president of the newly formed British Columbia Engineering Co. Ltd. (EWEST, October, p 129) has been made vice-president and executive engineer for B. C. Electric Co. His former post of chief engineer has been taken over by **Jack H. Steele,** executive assistant to Ingledow for nine years. **Dr. Harry L. Purdy** has been named BCE executive vice-president and takes over responsibility for the firm's general sales division and industrial relations subdivision. **John R. Powell** will be executive assistant to Purdy.

Shaad

• **Paul E. Shaad** has been appointed assistant general manager and assistant chief engineer of Sacramento, Calif., Municipal Utility District. Before his promotion he was assistant general manager and chief electrical engineer. He has been in charge of all SMUD system expansion since the beginning of operations in 1947. Previously he had served General Electric Co. and Hawaiian Electric Co.

• **Sam Ruvkun** and **J. E. Hughes** have been made assistants to the vice-president of Kaiser Engineers Division.

• A former Westerner, **John P. DeHetre,** has been appointed assistant general manager of sales for Youngstown Sheet & Tube Co., with offices in Chicago. He joined the company at Los Angeles in 1936; was made a field engineer six years later and in 1947 was transferred to Youngstown as development engineer.

• **Lewis A. Stanley,** for four years assistant Oregon state engineer, has been named to the state engineer's post to succeed the late Charles E. Stricklin. A native of Klamath Falls and graduate of Oregon State College, the new appointee has been in the state's engineering department 15 years, 11 as engineer for the state hydroelectric commission. During World War II he served with Corps of Engineers.

Thoman

• **E. O. Thoman** has been made assistant to the general manager of Pacific Power & Light Co. He formerly was Corvallis district manager for Mountain States Power Co. and will assist in administration problems involved in coordinating the districts and divisions of the merged systems. **Daniel Webster,** Seaside manager, will succeed Thoman at Corvallis. **Kenneth A. House,** Hood River manager, will be moved to Seaside and **Wilfred C. Sundby,** district sales supervisor at Pendleton, will be Hood River manager.

• **Patrick J. Selak** has joined the atomic energy division of Kaiser Engineers Division, Henry J. Kaiser Co. He will aid in development of industrial and research applications of nuclear energy. He formerly was with the Atomic Energy Commission.

• **Frank S. Thomas** has been made manager of the Coast Counties district in the San Jose division of PG and E. He was assistant regional manager of Coast Counties before the consolidation.

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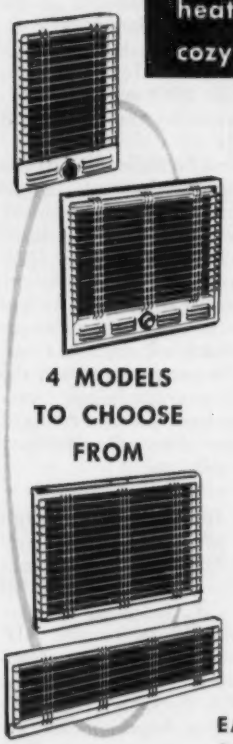

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Because Berko recognizes the value of well-engineered installations, our factory representatives and distributors will assist you in every possible way to see that the job is done properly. This not only assures customer satisfaction, but also provides utilities with a profitable load.

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Many Utilities in the West today are promoting electricity for better living. It's cleaner, safer, more convenient, and, in most cases, lower in cost. Added to this is Berko's own powerful advertising and merchandising program that promotes as well as closes sales for you. (Opposite is a typical ad.) Word-of-mouth advertising, too, will result in extra sales—because once a customer has experienced Berko's revolutionary heating principle, his praise is endless.

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By joining our electrical contractor-dealers you, too, can enjoy high profits from the sale of Berko Panels. You will build a bigger, more profitable business for yourself, you will have Berko's reputation for quality engineering behind you, and you will have one of the most powerful advertising and promotion programs ever devised to help you sell it.

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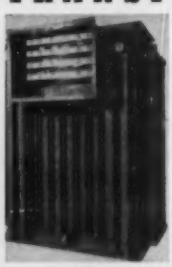

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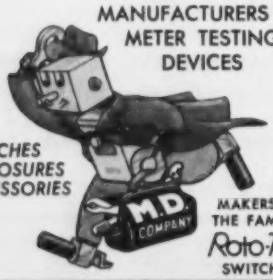

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Deaths

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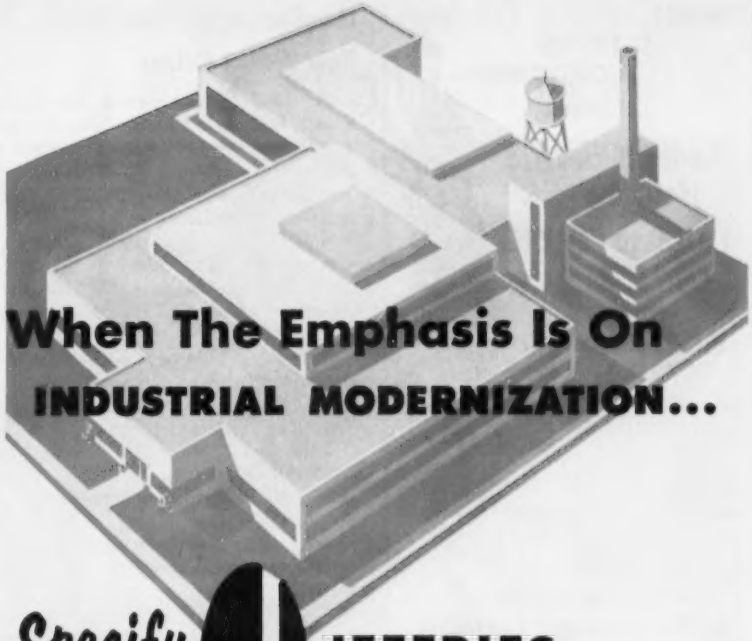

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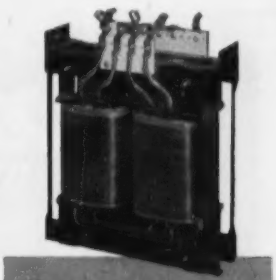
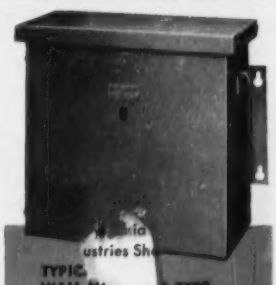


TYPICAL SINGLE PHASE INTERNAL CONSTRUCTION



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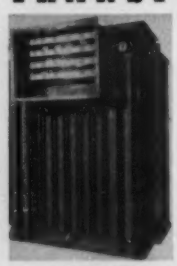

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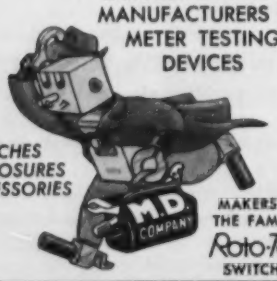

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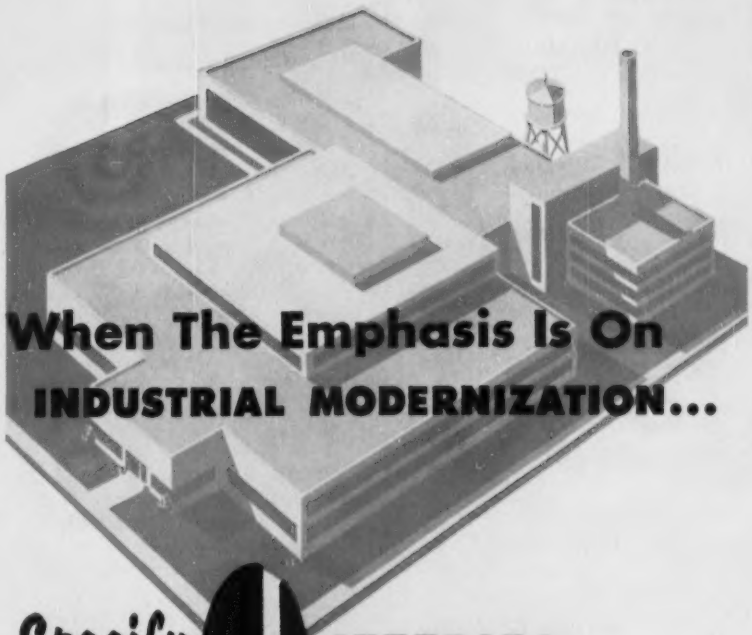

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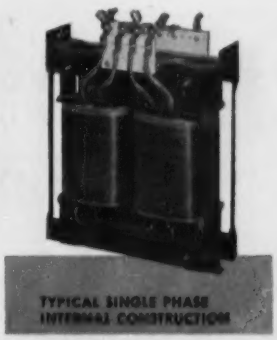

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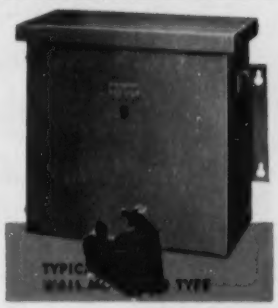

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Manufacturer Establishes New District Offices

Expanding its service on the Pacific Coast, Benjamin Electric Mfg. Co. has established new district offices at Los Angeles, Seattle and San Francisco. It has transferred Oliver "Ollie" Westberg from St. Louis to San Francisco as Pacific Coast division manager, succeeding Carl O. Martin, who retires after 41 years with the company. Martin will act as a special sales representative.

The Pacific Coast division has been divided into three districts: southern, northern and central, with headquarters remaining in San Francisco. G. A. "Jake" Hochenauer will manage the southern district, including the lower half of California and the State of Arizona. Henry Huber will be in charge of the northern district, which covers Oregon, Washington, Montana and the northern part of California and the states of Utah and Nevada and parts of Idaho. District offices are at 923 E. Third St., Los Angeles 13; 3018 45th Ave., S. W., Seattle 6; 829 Folsom St., San Francisco, division headquarters.

• **State Metal Fabricators Inc.**, Salinas, Calif., has been purchased by Kuhlman Electric Co. of Bay City, Mich. The property will be operated as a Western division plant, according to Kuhlman officials. The company will continue some of the machine plant's operations and will use the property for manufacturing small transformers and for warehousing. Its central location in the West Coast market area was an important factor in selecting the Salinas site, it was stated. Participating in negotiations were **A. Sbrana,** president, and **C. C. Brewer,** vice-president, State Metal Fabricators; **H. E. Greenwalt,** vice-president, and **G. R. Fluehr,** secretary-treasurer, Kuhlman Electric.

• **New appointees** to the staff of General Electric's microwave laboratory in Palo Alto are **James W. Nelson** Jr. manager for advanced tube development, and **George C. Trotter,** business manager. **Homer R. Oldfield** Jr. is general manager of the laboratory, which was established recently to develop and explore applications of new types of microwave electron tubes.

• **Among representatives** attending the recent three-day sales conference of Southern States Equipment Corp. in Hampton, Ga., were: **W. H. Eddy** and **Norman Fenton,** Phoenix; **Lee Rawlings,** Salt Lake City; **R. D. Andrews,** Los Angeles.

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167 KVA
Featherweight
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POLE STAR
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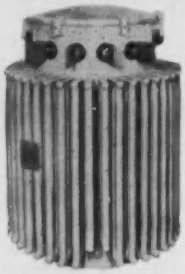
TRANSFORMER



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• **Air conditioning** was described as America's fastest growing industry, with almost inexhaustible markets still barely scratched by John A. Gilbreath, manager of the Westinghouse air conditioning division, at a conference of distributors and dealers in Pasadena, Calif., last month. He forecast that sales of air conditioners for commercial, industrial and residential use will soar 1,000% in the next 10 years. In the residential market alone, he predicted, 50% of the new homes to be built within the next decade will have central air conditioning. Sales have increased almost 500% from 20,000 to 100,000 units in the last six years, he said.

• **Line Material** Co. is building a 27,000-sq-ft warehouse on Shore Road next to the Union Carbide plant in South San Francisco. Construction was to start in December and to be completed by February 1. The structure will be the sales office and warehouse for northern California. Other warehouses are in Los Angeles, Portland, Seattle and Spokane.

• **Perpetuating the name of John S. Lapp,** its founder, Lapp Insulator Co. has dedicated its new high-voltage laboratory in LeRoy, N. Y. The laboratory named in his honor was in the planning stage at the time of Mr. Lapp's death in May 1953. It will be used for research and testing of high-voltage porcelain insulators and can handle 60-cycle testing at more than 1,000,000 v, impulse testing at 2,500,000 v and high-current testing.

• **Announcing promotions** in its sales staff, Hubbard & Co. reported that **Wallace E. Stroberg** will assist the Southwest sales manager, Don V. Cole, in New Mexico, Colorado, southeastern Wyoming. Assisting the midwest sales manager, John C. Carrol Jr., in eastern Montana is **F. G. Lanick.**

• **The Okonite Co.** last month moved its San Francisco headquarters to 701 Phelps St., zone 24. According to I. W. Borda, vice-president, consolidation of the company's sales office with its warehouse operations and modernized facilities will result in faster and better service.

• **William Wilt,** Bussmann Mfg. Co. representative in southern California for many years, retires the first of the year and **A. O. "Chick" Alderman** for many years Seattle and Northwest representative, now Western Division manager, will headquarter in Los Angeles. **Tom C. Stausser** will be representative in the Northwest.

Today's *Positive Answer* to Industrial–Commercial Lighting Problems!

Rows of Sylvania IC Fixtures provide 50 foot candles in testing department at Sylvania's new Batavia, New York, television plant.

Note clear, high-level office lighting obtained with Sylvania IC Fixtures.

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SYLVANIA

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LIGHTING • RADIO • ELECTRONICS • TELEVISION

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PROFILES

When San Diego honored electrical pioneers during the Jubilee celebration, Jesse F. Zwiener, master of ceremonies and electrical contractor with 50 years in the industry, presented a medallion to Albert E. Johnstone, who has served the industry 59 years

Zwiener Johnstone

Eunice Kelly, San Francisco high school student, sells Harold G. Rethmeyer, central Pacific district manager for Westinghouse, a stock certificate in the West-Kit Co., of which she is president. Westinghouse is sponsor of this Junior Achievement enterprise. The youths financed a novelty jewelry manufacturing business, which they own and operate. W. M. Bevier and A. H. Jackson, Westinghouse employees, are advisors

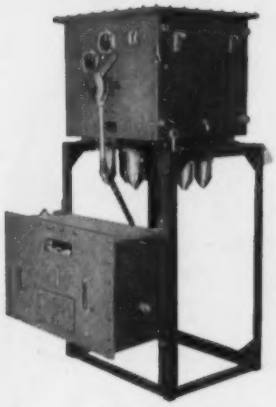
Bevier Kelly Rethmeyer Jackson

Thomas Stampfli Volkerts Albert

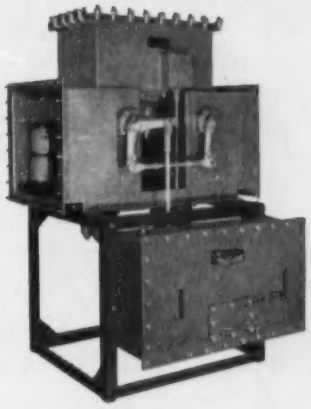
For saving the life of their foreman by prompt application of artificial respiration, C. T. Stampfli and J. E. Volkerts, linemen for the Lassen division of California-Pacific Utilities Co., received the Edison Electric Institute Award. Here E. K. Albert, company president, presents the award at dinner in their honor as the foreman, S. S. Thomas, looks on

AVOID OUTAGES

by transferring important loads to an alternate feeder automatically



Type "RAD" double throw oil switch unit with Model "F" automatic mechanism.



Type "DRA" two single throw oil switch unit with Model "F" automatic mechanism.

- **When preferred feeder voltage fails, the load is automatically transferred to the emergency feeder.**
- **When preferred feeder voltage is restored (for a period of ¾ minute) the load is automatically returned to the preferred feeder.**
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- **Model "F6" automatic mechanism provides for remote operator selection of either feeder as the "preferred."**

The automatic mechanisms are applied to various forms of Type "RA" oil switches, either for underground cables or overhead connections—up to 23 Kv., 400 amperes. All control wiring is done at the factory. Installation of the unit merely involves connection of the feed and load cables or wires.

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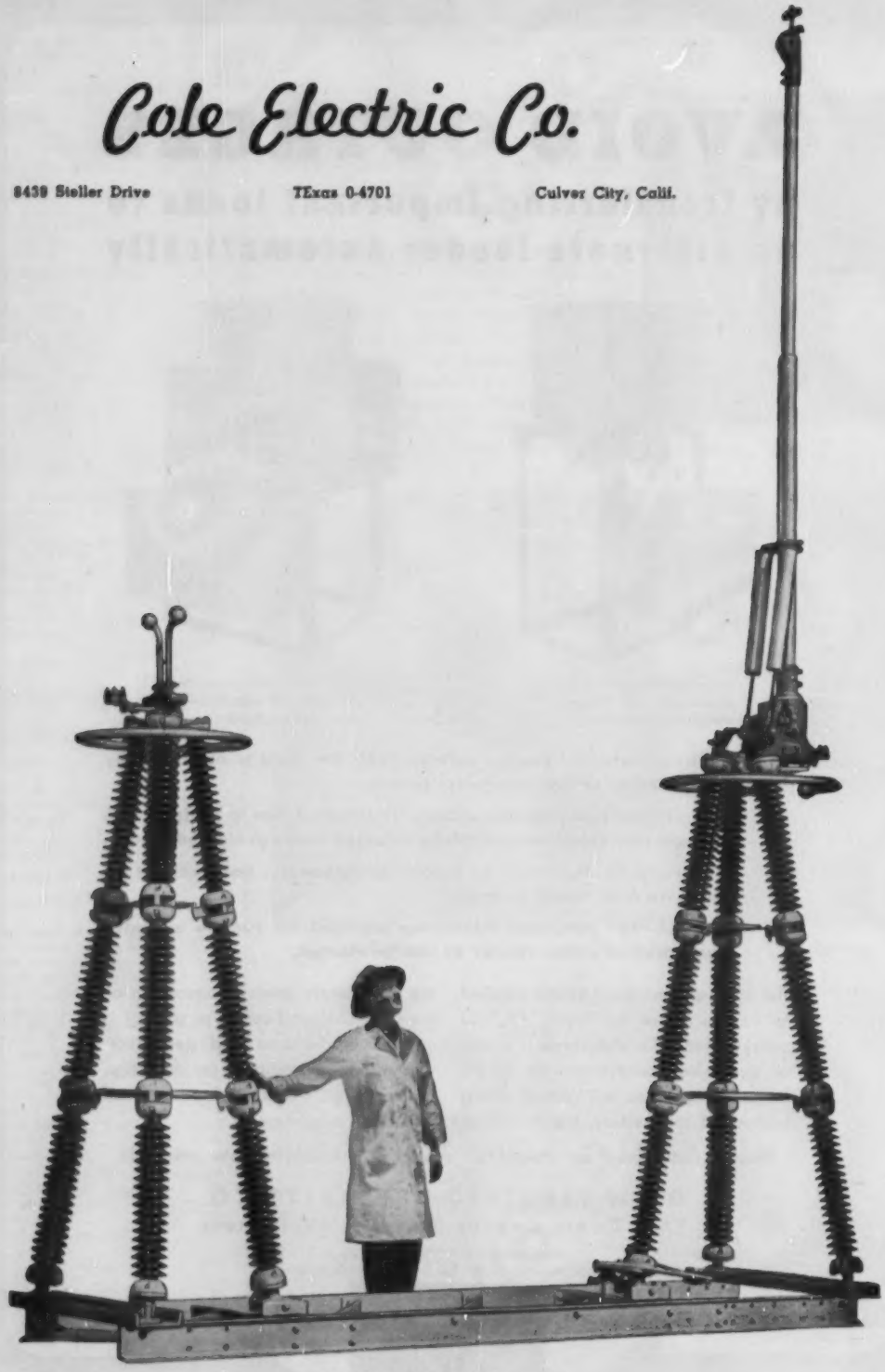

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MEET A LIVE WIRE!

• *Henry B. Sargent*

President and General Manager of Arizona Public Service Company, became a member of the Pacific Coast Electrical Association in 1946. Active in Association activities from the start, he became a Vice President and Director of PCEA in 1948 and presently is serving his fourth terms in the dual capacities.

A southerner through and through, Sargent was born in New Orleans, raised in Vicksburg, Mississippi, and attended Tulane University. Graduating in 1927 he went to work for Mississippi Light and Power Company as a utility helper and meter reader. During the next 20 years he rose to become Vice President and General Manager, resigning in 1946 to join Central Arizona Light and Power Company as Executive Vice President. In 1951, when this firm became Arizona Public Service Company, he was elected to head the company.

THE electric industry is *your* industry. Whatever and whoever helps it, helps *you*. For the past 37 years the Pacific Coast Electrical Association has been doing just that, but PCEA is people—men like Henry Sargent—and they need your help. Working to improve the industry's service to its customers is a king-size job, requiring the best efforts of everyone concerned. If you aren't a member of PCEA we urge you to join us. If you already belong we urge you to be as active as possible, because there is much to be done — for your own good and the good of the entire electric industry. Contact either of our offices for further information.

Pacific Coast Electrical Association

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